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COLOR - RESOLUTION - 3

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SITE NAME	**SAUGET AREA 2**
DOC ID #	**157297**
DOCUMENT VARIATION	**__ COLOR OR _X_ RESOLUTION**
PRP	
PHASE	**SAR**
OPERABLE UNITS	
PHASE **(AR DOCUMENTS ONLY)**	___ Remedial ___ Removal ___ Deletion Docket ____ ____ Original ____ Update #___ Volume __of __
COMMENT(S)	

COMMENTS ON SAUGET AREA 2 HAZARD RANKING SYSTEM LISTING DOCUMENT

Exhibits 1- 45

December 13, 2001

Prepared for AmerenUE, St. Louis, MO
Prepared by NewFields

NEWFIELDS

INDEX OF EXHIBITS

25. 40 CFR, Part 300, Appendix A- The Hazard Ranking System. 55FR 51583, Dec.14, 1990 Section 4.1.3.2.1.3, Table 4-15 and Table 4-16.

26. 40 CFR, Part 300, Appendix A- The Hazard Ranking System. 55FR 51583, Dec.14, 1990. Section 4.1.2.2.1.3, Table 4-12, Section 4.1.3.2.1.4, and Table 4-16.

27. 40 CFR, Part 300, Appendix A- The Hazard Ranking System. 55FR 51583, Dec.14, 1990 Table 4-13.

28. 40 CFR, Part 300, Appendix A- The Hazard Ranking System. 55FR 51583, Dec.14, 1990 Section 4.1.3.3.1, Table 4-13.

29. Acer Environmental, Inc. Literature Review for Threatened & Endangered Species for Areas Q and P Sauget, Illinois, 2001.

30. 40 CFR, Part 300, Appendix A- The Hazard Ranking System. 55FR 51583, Dec.14, 1990. Section 4.1.4.3, Table 4-22, Table 4-23, and Table 4-24.

31. US Environmental Protection Agency. Hazard Ranking System Guidance Manual. November 1992. Page 333

32. 40 CFR, Part 300, Appendix A- The Hazard Ranking System. 55FR 51583, Dec.14, 19903. Section 3.1.1 and 3.1.2.

33. 40 CFR, Part 300, Appendix A- The Hazard Ranking System. 55FR 51583, Dec.14, 1990 Table 3-2.

34. 40 CFR, Part 300, Appendix A- The Hazard Ranking System. 55FR 51583, Dec.14, 1990. Section 3.1.2.2, Figure 3-2, Table 3-3, and Table 3-4.

35. 40 CFR, Part 300, Appendix A- The Hazard Ranking System. 55FR 51583, Dec.14, 1990. Section 3.1.2.3, Table 3-5.

36. 40 CFR, Part 300, Appendix A- The Hazard Ranking System. 55FR 51583, Dec.14, 1990. Section 3.1.2.4 Tables 3-6 and 3-7.

37. 40 CFR, Part 300, Appendix A- The Hazard Ranking System. 55FR 51583, Dec.14, 1990. Table 3-1.

38. Howard, Philip H. Handbook of Environmental Fate and Transport Data for Organic Chemicals, Vol 1. Lewis Publishers: 1989.

39. Montgomery, John H. Groundwater chemicals. Lewis Publishers. New York: 1996.

40. US Environmental Protection Agency. Hazard Ranking System Guidance Manual. November 1992, page 12.

41. Illinois EPA. Sample data sheets from samples collected from Source Q, Nov. 9-10, 1994. November through December 1994.

42. Ecology and the Environment, Inc. Draft of Federal On-scene Coordinator's Report for Area 2 Site Q, Cahokia, St. Clair County, Illinois. July 31, 2000.

43. US Environmental Protection Agency. Hazard Ranking System Guidance Manual. November 1992, page 13.

44. NewFields. List of data sources and CD containing Access database. December 2001.

45. AmerenUE. Comments on Sauget Area 2 Hazard Ranking System Listing Document, December 13, 2001.

Exhibit 1

HRS DOCUMENTATION RECORD COVER SHEET

Name of Site: Sauget Area 2
EPA ID No. ILD000605790

Contact Persons

Site Investigation: Ken Corkill
Illinois EPA

Documentation Record: Julia Barr
DynCorp

Pathways, Components, or Threats Not Scored

The air migration pathway was not scored because of the lack of documented releases to air. This pathway would not significantly add to the site score.

The ground water migration pathway was not scored, even though there is an observed release to the aquifer, because there are few people using the water for a drinking water supply.

The soil exposure pathway was not scored because of the lack of a large number of documented targets. This pathway would not significantly add to the site score.

HRS DOCUMENTATION RECORD

Name of Site:	Sauget Area 2	
EPA Region:	5	Date Prepared: 6/05/2001
Street Address of Site:	Monsanto Avenue	
City, County, State:	Sauget, St. Clair County, Illinois	
General Location in the State:	East bank of Mississippi River, Southwest Illinois	

Topographic Map: Cahokia, IL-MO 1998 (Ref. 3)

Latitude: 38° 35' 50.5" North Longitude: 90° 10' 56" West

Reference Point: Intersection of Mobile Street and American Bottom Road (Ref. 4)

Scores

Air Pathway	Not Scored (NS)
Ground Water Pathway	NS
Soil Exposure Pathway	NS
Surface Water Pathway	100
HRS SITE SCORE	**50.00**

WORKSHEET FOR COMPUTING HRS SITE SCORE

		S		S^2
1.	Ground Water Migration Pathway Score (S_{gw}) (from Table 3-1, line 13)	NS		
2a.	Surface Water Overland/Flood Migration Component (from Table 4-1, line 30)	100		
2b.	Ground Water to Surface Water Migration Component (from Table 4-25, line 28)	100		
2c.	Surface Water Migration Pathway Score (S_{sw}) Enter the larger of lines 2a and 2b as the pathway score.	100		10,000
3.	Soil Exposure Pathway Score (S_s) (from Table 5-1, line 22)	NS		
4.	Air Migration Pathway Score (S_a) (from Table 6-1, line 12)	NS		
5.	Total of $S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2$			10,000
6.	**HRS Site Score** Divide the value on line 5 by 4 and take the square root		50.00	

TABLE 4-1
SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET

Factor Categories and Factors	Maximum Value	Value Assigned
DRINKING WATER THREAT		
Likelihood of Release		
1. Observed Release	550	550
2. Potential to Release by Overland Flow		
2a. Containment	10	NS
2b. Runoff	25	NS
2c. Distance to Surface Water	25	NS
2d. Potential to Release by Overland Flow (lines 2a x [2b + 2c])	500	NS
3. Potential to Release by Flood		
3a. Containment (Flood)	10	NS
3b. Flood Frequency	50	NS
3c. Potential to Release by Flood (lines 3a x 3b)	500	NS
4. Potential to Release (lines 2d + 3c, subject to a maximum of 500)	500	NS
5. Likelihood of Release (higher of lines 1 and 4)	550	550
Waste Characteristics		
6. Toxicity/Persistence	a	NS
7. Hazardous Waste Quantity	a	NS
8. Waste Characteristics	100	NS
Targets		
9. Nearest Intake	50	NS
10. Population		
10a. Level I Concentrations	b	NS
10b. Level II Concentrations	b	NS
10c. Potential Contamination	b	NS
10d. Population (lines 10a + 10b + 10c)	b	NS
11. Resources	5	NS
12. Targets (lines 9 + 10d + 11)	b	NS
Drinking Water Threat Score		
13. Drinking Water Threat Score ([lines 5 x 8 x 12]/82,500, subject to a maximum of 100)	100	NS

Factor Categories and Factors	Maximum Value	Value Assigned
HUMAN FOOD CHAIN THREAT		
Likelihood of Release		
14. Likelihood of Release (same value as line 5)	550	550
Waste Characteristics		
15. Toxicity/Persistence/Bioaccumulation	a	5×10^8
16. Hazardous Waste Quantity	a	100
17. Waste Characteristics	1,000	320
Targets		
18. Food Chain Individual	50	45
19. Population		
19a. Level I Concentrations	b	0
19b. Level II Concentrations	b	0.03
19c. Potential Human Food Chain Contamination	b	0
19d. Population (lines 19a + 19b + 19c)	b	0.03
20. Targets (lines 18 + 19d)	b	45.03
Human Food Chain Threat Score		
21. Human Food Chain Threat Score ([lines 14 x 17 x 20]/82,500, subject to a maximum of 100)	100	96.06

Factor Categories and Factors	Maximum Value	Value Assigned
ENVIRONMENTAL THREAT		
Likelihood of Release		
22. Likelihood of Release (same value as line 5)	550	550
Waste Characteristics		
23. Ecosystem Toxicity/Persistence/Bioaccumulation	a	5×10^8
24. Hazardous Waste Quantity	a	100
25. Waste Characteristics	1,000	320
Targets		
26. Sensitive Environments		
26a. Level I Concentrations	b	0
26b. Level II Concentrations	b	425
26c. Potential Contamination	b	0
26d. Sensitive Environments (lines 26a + 26b + 26c)	b	425
27. Targets (value from 26d)	b	425
Environmental Threat Score		
28. Environmental Threat Score ([lines 22 x 25 x 27]/82,500, subject to a maximum of 60)	60	60
SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE FOR A WATERSHED		
29. Watershed Score[c] (lines 13 + 21 + 28, subject to a maximum of 100)	100	100
SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORE		
30. Component Score (S_{of})[c], (highest score from line 29 for all watersheds evaluated, subject to a maximum of 100)	100	100

[a]Maximum value applies to waste characteristics category.
[b]Maximum value not applicable.
[c]Do not round to nearest integer.

TABLE 4-25
GROUND WATER TO SURFACE WATER MIGRATION PATHWAY SCORESHEET

Factor Categories and Factors	Maximum Value	Value Assigned
DRINKING WATER THREAT		
Likelihood of Release to an Aquifer		
1. Observed Release	550	550
2. Potential to Release		
2a. Containment	10	NS
2b. Net Precipitation	10	NS
2c. Depth to Aquifer	5	NS
2d. Travel Time	35	NS
2e. Potential to Release [lines 2a x (2b + 2c + 2d)]	500	NS
3. Likelihood of Release (higher of lines 1 and 2e)	550	550
Waste Characteristics		
4. Toxicity/Mobility	a	NS
5. Hazardous Waste Quantity	a	NS
6. Waste Characteristics	100	NS
Targets		
7. Nearest Well	50	NS
8. Population		
8a. Level I Concentrations	b	NS
8b. Level II Concentrations	b	NS
8c. Potential Contamination	b	NS
8d. Population (lines 8a + 8b + 8c)	b	NS
9. Resources	5	NS
10. Targets (lines 7 + 8d + 9)	b	NS
Drinking Water Threat Score		
11. Drinking water Threat Score ([lines 3 + 6 + 10] / 82,500, subject to a maximum of 100)	100	NS

Factor Categories and Factors	Maximum Value	Value Assigned
HUMAN FOOD CHAIN THREAT		
Likelihood of Release		
12. Likelihood of Release (same value as line 3)	550	550
Waste Characteristics		
13. Toxicity/Mobility/Persistence/Bioaccumulation	(a)	5×10^8
14. Hazardous Waste Quantity	(a)	10,000
15. Waste Characteristics	1,000	1,000
Targets		
16. Food Chain Individual	50	45
17. Population		
17a. Level I Concentrations	(b)	0
17b. Level II Concentrations	(b)	0.03
17c. Potential Human Food Chain Contamination	(b)	0
17d. Population (lines 17a + 17b + 17c)	(b)	0.03
18. Targets (lines 16 + 17d)	(b)	45.03
Human Food Chain Threat Score		
19. Human Food Chain Threat Score ([lines 12 x 15 x 18] / 82,500, subject to a maximum of 100)	100	100

[a]Maximum value applies to waste characteristics category.
[b]Maximum value not applicable.
[c]Do not round to nearest integer.

Factor Categories and Factors	Maximum Value	Value Assigned
ENVIRONMENTAL THREAT		
Likelihood of Release		
20. Likelihood of Release (same value as line 3)	550	550
Waste Characteristics		
21. Ecosystem Toxicity/Mobility/Persistence/Bioaccumulation	(a)	5×10^8
22. Hazardous Waste Quantity	(a)	10,000
23. Waste Characteristics	1,000	1,000
Targets		
24. Sensitive Environments:		
24a. Level I Concentrations	(b)	0
24b. Level II Concentrations	(b)	425
24c. Potential Contamination	(b)	0
24d. Sensitive Environments (lines 24a + 24b + 24c)	(b)	425
25. Targets (value from line 24d)	(b)	425
Environmental Threat Score		
26. Environmental Threat Score ([lines 20 x 23 x 25]/ 82,500, subject to a maximum of 60)	60	60
GROUND WATER TO SURFACE WATER MIGRATION COMPONENT SCORE FOR A WATERSHED		
27. Watershed Score[c] (lines 11 + 19 + 26, subject to a maximum of 100)	100	100
28. Component Score (S_{gs})[c] (highest score from line 27 for all watersheds evaluated, subject to a maximum of 100)	100	100

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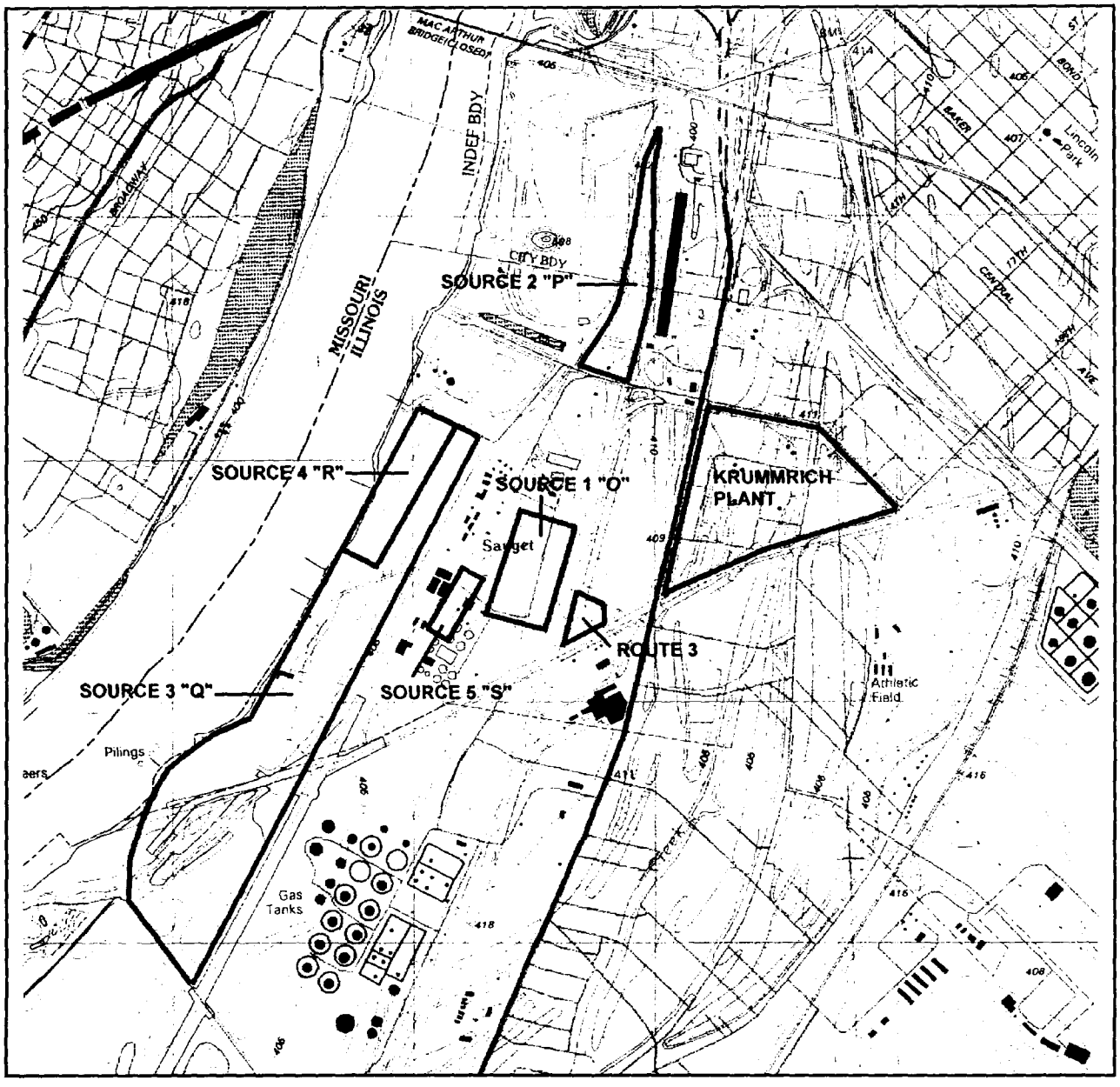

Source: Base Map is a Portion of the Following 7.5 Minute Series U.S.G.S Quadrangle : Cahokia, IL-MO, 1998

FIGURE 1	SITE LOCATION MAP
	SAUGET AREA 2
	SAUGET AND CAHOKIA, ILLINOIS
	DATE: MARCH 1, 2001

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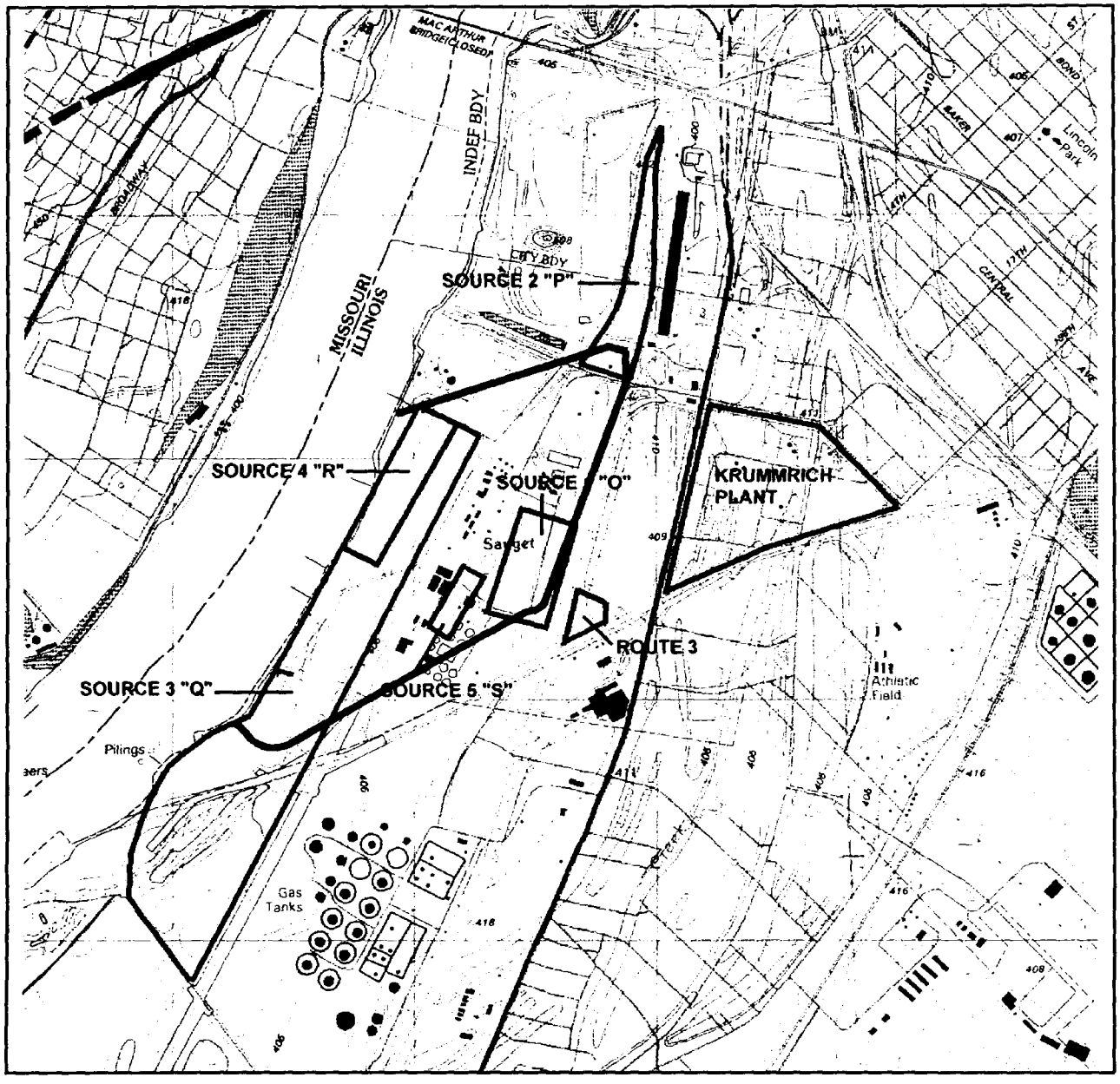
THE ART OF TECHNOLOGY



Source: Base Map is a Portion of the Following 7.5 Minute Series U.S.G.S Quadrangle : Cahokia, IL-MO, 1998

FIGURE 2	GROUND WATER PLUME
N 0 0.5 1 MILES	SAUGET AREA 2
	SAUGET AND CAHOKIA, ILLINOIS
	DATE: MARCH 26, 2001

REFERENCES

Ref. No.	Description of the Reference
1.	U.S. Environmental Protection Agency (EPA). Hazard Ranking System, 55 FR 51533 (40 CFR Part 300, Appendix A). December 14, 1990. 165 pages.
2.	EPA. Superfund Chemical Data Matrix (SCDM). Publication 9345.1-22, EPA/540/R-961029, PB96-963510. June 1996. Publicly Available Document - relevant pages included. 42 pages.
3.	U.S. Geological Survey (USGS), Cahokia, Illinois; Webster Groves, Missouri; and Oakville, Missouri Quadrangles, 7.5 Minute Series, Topographic Maps. 1998. 3 Maps.
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5.	Ecology and Environment, Inc. Sauget Area 1 and 2 Sites, St. Clair County, Illinois, Volume 2 - Sauget Area 2 Data Tables/Maps. ARCS Contract No. 68-W8-0086, Work Assignment No. 47-5N60. February 1998. 571 pages.
6.	Illinois EPA, Pre-Remedial Unit. CERCLA Screening Site Inspection (SSI): Sauget Sites Area #2. 1991. 161 pages.
7.	Ecology and Environment, Inc. Expanded Site Investigation Dead Creek Project Sites at Cahokia/Sauget, Illinois, Final Report Volume 2 of 2. May 1988. 59 pages.
8.	Ecology and Environment, Inc. Draft of Federal On-scene Coordinator's Report for Area 2 Site Q, Cahokia, St. Clair County, Illinois. July 31, 2000. 88 pages.
9.	Illinois EPA. Analytical data sheets from samples collected during the May 1999 Expanded Site Inspection, May - June 1999. 300 pages.
10.	Army Corps of Engineers, St. Louis District. Excerpts from 1979 Flood Manual and photos of the 1993 Flood. February, 2000. 15 pages.
11.	Mensing, Kenneth. Photographs taken during sampling event of discharge to the Mississippi River. I.D.# 1630200005, Superfund/Technical. December 14, 1988. 7 pages.
12.	Illinois EPA. Trip Report for: Solutia / W. G. Krummrich Plant, May 1999 Expanded Site Inspection. March, 2000. 27 pages.
13.	Illinois EPA. Sauget Area 2 site photos. September 1993. 10 pages.
14.	Illinois EPA. Trip Report for: Sauget Area 2, May 1999 Expanded Site Inspection. March, 2000. 38 pages.
15.	Glosser, Deanna, Illinois Department of Natural Resources (IDNR). Natural Resource and Recreational Information. March 14, 2000. 6 pages.
16.	Roux Associates, Inc. Summary of Ground-Water Quality Conditions, W. G. Krummrich Plant Solutia, Inc., Sauget, Illinois, Volume I of II. December 9, 1997. 82 pages.
17.	Geraghty & Miller, Inc. Remedial Investigation at Sauget Site R, Monsanto Company, Sauget, Illinois; Appendix F - Ground Water Flow Conditions. August 1994. 9 pages.

18. U. S. Army Corps of Engineers. Investigation of Underseepage, Mississippi River Levees, Alton to Gale, IL. Volume 1. Technical Memorandum No. 3-430. April 1956. 221 pages.

19. Barr, Julia. DynCorp. Project Note: Adjusted CRQL\CRDLs. May 2001. 1 page.

20. McClain, Bill. Division of Natural Heritage, Illinois Department of Conservation. Wetland Determinations for Dead Creek Near Sauget, St. Clair County, Illinois. July 1992. 22 pages.

21. Thomas, Paul A. B., Director, Health and Safety, Rollins Environmental Services, Inc. Health and Safety Plan for Monsanto Industrial Chemical Company. August 27, 1985. 4 pages.

22. Illinois Department of Transportation. Over-sized Air Photos taken March 4, 1975 and February 27, 1980 used to determine area of sources. 2 maps.

23. U. S. EPA Validated Sediment Sampling Results from the Mississippi River at the Solutia Facility Located in Sauget, IL. October-November 2000. 56 pages.

24. Geraghty & Miller. Analytical data sheets from samples included in the 1994 Remedial Investigation at Sauget Site R. May-June 1992. 120 pages.

25. Illinois EPA. Sample data sheets from samples collected from Source Q, November 9-10, 1994. November-December, 1994. 42 pages.

26. Illinois EPA. Sample data sheets for samples collected from Source S, March 22, 1995. March-April 1995. 24 pages.

27. U.S. Geological Survey. Streamflow data for Mississippi River at St. Louis, Missouri; gauging station 07010000. URL: http://rt02dmorll.er.usgs.gov/rt-cgi/gen_stn_pg?station=07010000. Accessed December 22, 2000. 3 pages.

28. Wagner, Mark, Telephone Conversation Record with Captain Ottis, IDNR, Alton Illinois; Mississippi River fishery. May 10, 2000. 2 pages.

29. Illinois Department of Natural Resources and U.S. Fish and Wildlife Service. Federal and State Endangered and Threatened Species Lists. URL: http://dnr.state.il.us/espb/datelist.htm and http://ecos.fws.gov/webpage/webpage_vip_listed.html?code=V&listings=0. Accessed May 16, 2000. 6 pages.

30. U. S. EPA. Quick Reference Fact Sheet: Using Qualified Data to Document an Observed Release and Observed Contamination. EPA 540-F-94-028. November 1996. 18 pages.

SITE DESCRIPTION

The Sauget Area 2 site is the location of the release of hazardous substances resulting from the treatment and disposal of hazardous waste in the floodplain bordering the east side of the Mississippi River. The Sauget Area 2 site lies within the corporate boundaries of 3 towns: Cahokia, East St. Louis, and Sauget, Illinois. Adjacent to this site is the Sauget Area I superfund site. The Sauget Area 2 site consists of five sources, including a backfilled lagoon (O), four landfills (Q, P, R, S), and the ground water and surface water contamination emanating from these sources. The estimated area of the site, including all of the sources is 312 acres. The site is located atop an ancient sandbar created by the meandering nature of the Mississippi River.

The ground water table elevation is essentially the same as the river water height, and seasonally is at or above (during floods) the land surface. Water and entrained contamination moves freely from the ground water into or out of the river depending on the season. A levee was constructed bisecting the site in the 1950s to prevent surface water from flooding areas east of the levee, including several of the site sources, but does not prevent sources west of the levee being inundated by spring floods. It also does not restrict contaminant transport in the direction of the river from sources east of the levee, through the unsaturated and saturated zones under the levee. All five site sources are, at times, in the water table, and contamination migrating from them has commingled to the point that the resulting ground water contaminant plumes from each source cannot be isolated and extends between all the sources. In addition, some of these sources were placed directly into wetland areas. Contaminated sediments identified with the site are also present in the Mississippi River adjacent to the site.

High levels of chlorobenzenes, chlorophenols, chloroanilines, nitroanilines, polychlorinated biphenyls (PCBs) and heavy metals have been found in various combinations in each source, in the ground water below the sources and in the Mississippi River adjacent to the sources. Monsanto Chemical Company began operations at the former Commercial Acid Company in 1917. Industrial wastes generated at the facility were deposited within the property boundaries of the Krummrich/Solutia plant, as well as other landfill sites within the village of Sauget. Disposal began at the Sauget Area 2 Site in the mid to late 1950s when the levee was created.

From 1957 to 1977, Sauget and Company, Inc., owned by Leo Sauget, arranged for the transportation and disposal of chemical waste products generated by Monsanto to landfill R. From 1966 to 1973, Source 3 (Q) was also being used to dispose of municipal and hazardous wastes. Many of the chemical wastes discovered at Source 3 (Q) are identical to those found at Source 4 (R) as the two sites were operated by the same firm, Sauget and Company, Inc., during a similar time frame.

Between 1960 and 1980, Monsanto contributed almost 80% of the total wastewater volume to the Village of Monsanto/Sauget POTW. The wastes present in the dewatering lagoons [source 1 (O)] are similar to those found elsewhere at Sauget Area 2. Also during this time, beginning in 1972, Monsanto and the Edwin Cooper Company were permitted to dispose industrial waste at a landfill known as Source 2 (P). Sampling indicated significant levels of benzene compounds, which were products produced at the Monsanto chemical plant during Source 2's (P) operation.

Source 5 (S) was used as a still-bottom disposal area for Clayton Chemical Company after 1973. This disposal pit was allegedly excavated by Paul Sauget/Sauget and Company for Clayton's use. Waste found in this area resembles waste from other sources.

In addition to the sources mentioned above, a ground water plume exists below the site. The ground water plume contains a mixture of the hazardous substances found in the other sources. Due to limited sampling and the nature of the ground water flow beneath the site, the exact extent of the plume is unknown. But, the ground water plume extends from the river edge, where it is in direct communication with the river, to west of the flood levee.

Contamination at the Krummrich/Solutia facility is not being evaluated in the scoring at this time as it may be remediated under a separate authority.

2.2 SOURCE CHARACTERIZATION

2.2.1 SOURCE IDENTIFICATION

Name of source: Source O

Number of source: 1

Source Type: Surface Impoundment

Description and Location of Source:

Source O consists of four inactive sludge dewatering lagoons associated with the Village of Monsanto/Sauget Wastewater Treatment Plant (WWTP)[1]. The source is located on Mobile Avenue in Sauget, east of the flood control levee. The source covers approximately 20 acres to the northeast of the American Bottoms WWTP, which replaced the Village of Monsanto/Sauget WWTP in the late 1980s (figure 1). The lagoons have been covered with clay and vegetated, and no waste material is present at the surface (Ref.5, p. 15). An access road to the more recent WWTP runs through the middle of the source. The Village of Monsanto/Sauget WWTP began operation in approximately 1952 (Ref. 7, p. O-1). The plant treated waste from area industries and residents. Approximately 10 million gallons per day of wastewater was treated, more than 95% was from area industries (Ref. 7, p. O-1). Industries that contributed wastewater to the plant include Monsanto, Cerro Copper, Sterling Steel Foundry, Amax Zinc, Rogers Cartage, Edwin Copper, and Midwest Rubber (Ref. 7, p. O-1). The lagoons which comprise Source O were used as sludge drying beds for the Village of Monsanto/Sauget WWTP (Ref. 14, p. 1). It is not known if sludge was removed from the lagoons prior to closure and capping, however, as shown below, hazardous substances have been found at depth in the source.

[1]Effluent from the plant was discharged to the Mississippi River under NPDES permit. The Sauget WWTP had many past violations of the NPDES permit, mainly due to chemical quality of the plant effluent (Ref. 7, p. O-1). Mercury, PCBs and organic solvents had been detected at levels which violated the set permit levels on several occasions. A 1982 USEPA study concluded that the effluent from the Sauget WWTP contributed a substantial volume of priority pollutants annually to the river (Ref. 7, p. O-1).

Containment:

Containment Description	Containment Factor Value	Ref.
Gas release to air:	NS	
Particulate release to air:	NS	
Release to ground water: As documented during site visits, this source has a vegetated cover in place but no liner or leachate collection and removal system or functioning ground water monitoring system.	10	Ref 1, Table 3-2 Ref. 5, p. 14, 15
Release via overland migration and flood: Overland Flow: As documented during site visits, this source has a vegetated cover in place, but has no functioning or maintained run-on control system and runoff management system, or liner with leachate collection and removal system, or a liner with functioning leachate collection and removal system above liner. Flood: There is no documentation that containment at the source is designed, constructed, operated, and maintained to prevent a washout of hazardous substances by flood.	9 10	Ref. 1, Table 4-2 Ref. 5, p. 14, 15 Ref. 1, Table 4-8 Ref. 5, p. 14, 15

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE

- Source Samples:

The following source sample documents the presence of the listed hazardous substances at the source. Sample X108 was collected during the Illinois EPA, May 1999 site visit (Ref. 14).

Sample ID	Sample Type	Date Collected	Hazardous Substance	Hazardous Substance Concentration (µg/kg)	Sample Quantitation Limit* (µg/kg)	Reference
X 108	Waste	5-24-99	Manganese	598	20.2	9, p. C-41; 14, p. 9, 10
			Vanadium	30.1	67.3	

* Adjusted CRQL/CRDL for substance (Ref. 19).

- Hazardous substances are listed to document the presence of the substance at the source and may be below SQL, however it is above the detection limit.

2.2.4 HAZARDOUS WASTE QUANTITY

2.4.2.1.1. Hazardous Constituent Quantity

Hazardous Constituent Quantity Assigned Value: 0

2.4.2.1.2. Hazardous Wastestream Quantity

Hazardous Wastestream Quantity Assigned Value: 0

2.4.2.1.3. Volume

Volume Assigned Value: 0

2.4.2.1.4. Area

Description

The area of the source was calculated from the aerial photograph that best outlined the source (3/4/75) (Ref. 22). The photographic scale was determined by measuring equal distances on the USGS 7.5 minute Cahokia Quadrangle and on the aerial photograph. A polar planimeter was used by Illinois EPA staff, to trace the perimeter of the source on the aerial photographs. Three consecutive runs were made over the source and the lowest area value was used (Ref. 14, p. 17)

Source Type	Units (ft^2)	References
Surface Impoundment	22.48 acres = 979,468.80 ft^2	Ref 14, p. 17

Sum (ft^2): 979,468.80 = A
Equation for Assigning Value (Ref. 1, Table 2-5): A/13

Area Assigned Value: 75,343.75

2.4.2.1.5. Source Hazardous Waste Quantity Value

Highest assigned value assigned from Ref. 1, Table 2-5: 75,343.75

2.2.1 SOURCE IDENTIFICATION

Name of source: Source P

Number of source: 2

Source Type: Landfill

Description and Location of Source :

Source P is an inactive, IEPA-permitted landfill covering approximately 28.6 acres in Sauget and East St. Louis, Illinois (figure 1; Ref. 14, p. 19). This landfill is located on the east side of the flood control levee (figure 1). The source is bordered on the west by the Illinois Central Gulf Railroad; on the south by Monsanto Avenue, and on the east by the Terminal Railroad Association railroad. The two railroads converge to delineate the north boundary (Ref. 7, p. P-1). Surface drainage is to the south-central portion of the source, which was not land filled due to the presence of a potable water line in this area. A depression area is also found along the east perimeter, adjacent to the Terminal Railroad (Ref. 7, p. P-1). Soil and vegetation in the northern and southern portions of this source have been identified as a wetland, according to the Division of Natural Heritage, Illinois Department of Conservation (Ref. 20, p. 14).

Sauget and Company began operating a waste disposal facility at Source P in 1973, permitted to accept only non-chemical waste from Monsanto. In 1974 Sauget and Company was granted a permit to accept diatomaceous earth filter cake from Edwin Cooper, Inc (Ref. 7, p. P-1). Violations of these permits were found during routine inspections of the source by the IEPA. In 1975, a routine inspection discovered several crushed fiber drums, labeled "Monsanto ACL-85, Chlorine Composition."(Ref 7, p. P-1) Additionally, during an inspection in 1977, 25 metal containers of phosphorus pentasulfide were found at the source. A Southern Railway slag pile and cinders were being used as final cover material. The IEPA found this material unsuitable as cover due to its high permeability and heavy metal content (Ref. 7, p. P-3).

Containment:

Containment Description	Containment Factor Value	Ref.
Gas release to air:	NS	
Particulate release to air:	NS	
Release to ground water: As documented from site visits, there is no evidence of a liner, adequate maintained engineered cover, functioning and maintained run-on control system and runoff management system, or functioning leachate collection and removal system.	10	Ref. 1, Table 3-2 Ref. 7, p. p-3
Release via overland migration and flood: Overland Flow: As documented from site visits, there is no evidence of a liner, adequate maintained engineered cover, or functioning and maintained run-on control system and runoff management system, or a liner with functioning leachate collection and removal system above liner. Flood: There is no documentation that containment at the source is designed, constructed, operated, and maintained to prevent a washout of hazardous substances by flood.	10 10	Ref. 1, Table 4-2 Ref. 7, p. p-3 Ref. 1, Table 4-8 Ref. 7, p. p-3

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE

- Source Samples:
The following source samples document the presence of the listed hazardous substances at the source. Samples X107 and X113 were collected by Illinois EPA during the May 1999 site visit (Ref. 14).

Sample ID	Sample Type	Date Collected	Hazardous Substance	Hazardous Substance Concentration (µg/kg)	Sample Quantitation Limit* (µg/kg)	Reference
X 107	Waste	5-26-99	Benzene	10,000	2020	9, p. A-52; 14, p. 9
			Toluene	25,000	2020	9, p. A-52; 14, p. 9
			Ethyl benzene	3600	2020	9, p. A-52; 14, p. 9
			Xylene (total)	15,000	2020	9, p. A-52; 14, p. 9
			Endosulfan I	440 P	2.5	9, p. A-60; 14, p. 10
			4,4-DDE	210 P	5	9, p. A-60; 14, p. 10
			Endosulfan II	320	5	9, p. A-60; 14, p. 10
			Aroclor 1248	4400	49.8	9, p. A-60; 14, p. 10
			Aroclor 1254	5900 P	49.8	9, p. A-60; 14, p. 10
			Copper	49.2	31.0	9, p. C-46; 14, p. 10
			Lead	140	3.7	9, p. C-46; 14, p. 10
			Vanadium	33.4	62.0	9, p. C-46; 14, p. 10
X 113	Waste	5-25-99	Phenol	65,000 D	63	9, p. A-101; 14, p. 9
			4 - Methyl phenol	5400	63	9, p. A-98; 14, p. 9
			4 - Chloroaniline	23,000	63	9, p. A-98; 14, p. 9
			Aldrin	140 P	2.6	9, p. A-104; 14, p. 10
			1,4 - Dichlorobenzene	8600	1.9	9, p. A-98; 14, p. 10
			Aroclor 1242	2400	50.4	9, p. A-104; 14, p. 10
			Chromium	21.9	11.8	9, p. C-45; 14, p. 10
			Nickel	26.5	47.4	9, p. C-45; 14, p. 10
			Zinc	988	23.7	9, p. C-45; 14, p. 10

D - diluted sample
P - greater than 25% difference for the detected concentrations between the two columns. The lower of the two results is reported.
* Adjusted CRQL/CRDL for substance (Ref. 19).
- Hazardous substances are listed to document the presence of the substance at the source and may be below SQL, however it is above the detection limit.

Source No: 2

2.2.4 HAZARDOUS WASTE QUANTITY

2.4.2.1.1. Hazardous Constituent Quantity

Hazardous Constituent Quantity Assigned Value: 0

2.4.2.1.2. Hazardous Wastestream Quantity

Hazardous Wastestream Quantity Assigned Value: 0

2.4.2.1.3. Volume

Volume Assigned Value: 0

2.4.2.1.4. Area

Description

The area of the source was calculated from the aerial photograph that best outlined the source. (2/27/80) (Ref. 22) The photographic scale was determined by measuring equal distances on the USGS 7.5 minute Cahokia Quadrangle and on the aerial photograph. A polar planimeter was used by Illinois EPA staff, to trace the perimeter of the source on the aerial photographs. Three consecutive runs were made over the source and the lowest area value was used (Ref. 14, p. 17)

Source Type	Units (ft^2)	References
Landfill	28.6 acres = 1,244,990.3 ft^2	Ref 14, p. 19

Sum (ft^2): 1,244,990.3 = A
Equation for Assigning Value (Ref. 1, Table 2-5): A/3400

Area Assigned Value: 366.17

2.4.2.1.5. Source Hazardous Waste Quantity Value

Highest assigned value assigned from Ref. 1, Table 2-5: 366.17

2.2.1 SOURCE IDENTIFICATION

Name of source: Source Q

Number of source: 3

Source Type: Landfill

Description and Location of Source (with reference to a map of the site):

Source Q is an inactive waste landfill in Sauget, Illinois that covers approximately 225 acres (Ref. 14, p. 18). The facility, which was operated by Sauget & Company between 1966 and 1973 (Ref. 7, p. Q-1). The source is located on the east bank of the Mississippi River and is on the river side (west) of the flood control levee (figure 1; Ref 7, p. Q-1). A railroad spur divides the source and several ponds exist on the unoccupied southern portion. The northern half of the source contains coal and cinders at the surface (Ref. 6, p. 2-5). Source Q was operated without a permit. The north side was registered with the IDPH in 1967, prior to formation of IEPA. The source is presently covered with black cinders which make it highly permeable. Source Q is presently being leased to the Pillsbury Company by its owners the Riverport Terminal and Fleeting Co. Most of Source Q is occupied by the Pillsbury Company, which operates a coal unloading and transfer facility (Ref. 7,p. Q-1). Erosion during the 1993 flood, which inundated Source Q and Source R, exposed buried drums later removed by USEPA (Ref. 13, pp. 1, 10).

Disposal operations began at Source Q in 1966. Several violations of the IEPA were documented in the early 1970s. The use of unsuitable cover materials, acceptance of liquid chemical wastes, and open burning were some of the violations. Between 1968 and 1972 septic tank pumpings were accepted and co-disposed with general municipal refuse on the source (Ref. 7, p. Q-1). Source Q was completely inundated during at least two Mississippi River flood events: The first in 1973 and the second in 1993 (Ref. 5, p. 21, 22). Photographs were taken of the exposed landfill material following the 1993 flood (Ref. 13, p. 1, 10). Many of the drums were exposed at the surface. Over time the deterioration of the drums contributed to the release of hazardous wastes to the surrounding soil, surface water and ground water (Ref. 8, p. 3). A CERCLA, time critical removal, coordinated by USEPA, began in October 1999, and removed 3,271 drums and approximately 15,000 tons of contaminated soil by its completion in April 2000 (Ref. 8, p. 2, 3). Due to limited resources and the amount of contamination, this removal action could not address all the contamination present on the site (Ref. 8, p. ii).

Containment:

Containment Description	Containment Factor Value	Ref.
Gas release to air:	NS	
Particulate release to air:	NS	
Release to ground water: Hazardous substances are present at the surface, there is no evidence of a liner, adequate maintained engineered cover, functioning and maintained run-on control system and runoff management system, or functioning leachate collection and removal system. Although a removal action was completed in April 2000, US EPA Region 5 considers it to be unfinished due to the contamination still present at the source.	10	Ref. 1, Table 3-2 Ref 5, p. 19
Release via overland migration and flood: Overland Flow: As documented from site visits, there is no evidence of an adequate maintained engineered cover, or functioning and maintained run-on control system and runoff management system, or a liner with functioning leachate collection and removal system above liner. Although a removal action was completed in April 2000, US EPA Region 5 considers it to be unfinished due to the contamination still present at the source.	10	Ref. 1, Table 4-2 Ref 5, p. 19
Flood: There is no documentation that containment at the source is designed, constructed, operated, and maintained to prevent a washout of hazardous substances by flood. Furthermore, the source has completely flooded at least twice in the past 30 years. Although a removal action was completed in April 2000, US EPA Region 5 considers it to be unfinished due to the contamination still present at the source.	10	Ref. 1, Table 4-8 Ref 5, p. 19

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE

- Source Samples:
The following source samples document the presence of the listed hazardous substances at the source. Samples X102-X105, and X111 were collected by Illinois EPA during the May 1999 site visit (Ref. 14).

Sample ID	Sample Type	Date Collected	Hazardous Substance	Hazardous Substance Concentration** (µg/kg)	Sample Quantitation Limit* (µg/kg)	Reference
X 102	Waste	5-24-99	Beryllium	4	7.5	9, p. C-40; 14, p. 10
			Chromium	57.3	15	9, p. C-40; 14, p. 10
			Cobalt	14.4	75.1	9, p. C-40; 14, p. 10
			Nickel	47.1	60.1	9, p. C-40; 14, p. 10
			Vanadium	96.7	75.1	9, p. C-40; 14, p. 10
			Zinc	386	30	9, p. C-40; 14, p. 10
X 104	Waste	5-26-99	Benzene	5800	2389	9, p. A-33; 14, p. 9
			Toluene	4800	2389	9, p. A-33; 14, p. 9
			Chlorobenzene	13,000	2389	9, p. A-33; 14, p. 9
			Xylene (total)	34,000	2389	9, p. A-33; 14, p. 9
			Phenol	220,000	75,046.9	9, p. A-35; 14, p. 9
			1,2,4 - Trichlorobenzene	430,000	2389	9, p. A-35; 14, p. 9
			4,4 - DDE	730,000 P	14,634	9, p. A-38; 14, p. 10
			4,4 - DDT	53,000 JP	14,634	9, p. A-38; 14, p. 10
			Aroclor 1016	5,400,000	146,341	9, p. A-38; 14, p. 10
			Aroclor 1232	8,800,000	146,341	9, p. A-38; 14, p. 10
			Aroclor 1242	8,500,000 P	146,341	9, p. A-38; 14, p. 10
			Aroclor 1248	25,000,000	146,341	9, p. A-38; 14, p. 10
			Aroclor 1254	17,000,000	146,341	9, p. A-38; 14, p. 10
			Aroclor 1260	8,100,000 P	146,341	9, p. A-38; 14, p. 10
			Barium	2450	223.0	9, p. C-48; 14, p. 10
			Lead	728	3.3	9, p. C-48; 14, p. 10
X 103	Waste	5-26-99	Delta - BHC	68 P	2.7	9, p. A-31; 14, p. 10
			Gamma - BHC (lindane)	55 P	2.7	9, p. A-31; 14, p. 10
			Endosulfan I	24 P	2.7	9, p. A-31; 14, p. 10
			4,4 - DDD	340 P	5.2	9, p. A-31; 14, p. 10
			Endosulfan Sulfate	59 P	5.2	9, p. A-31; 14, p. 10

Sample ID	Sample Type	Date Collected	Hazardous Substance	Hazardous Substance Concentration** (µg/kg)	Sample Quantitation Limit* (µg/kg)	Reference
			Endrin Aldehyde	87 P	5.2	9, p. A-31; 14, p. 10
			Gamma-chlordane	23 P	2.7	9, p. A-31; 14, p. 10
			Cadmium	12	5	9, p. C-47; 14, p. 10
			Copper	179	25	9, p. C-47; 14, p. 10
X 111	Waste	5-26-99	Ethyl benzene	7400	1900	9, p. A-80; 14, p. 9
			Naphthalene	860	490	9, p. A-82; 14, p. 9
			4 - Chloroaniline	1100	490	9, p. A-82; 14, p. 9
			2-Methylnaphthalene	540	490	9, p. A-82; 14, p. 9
			Diethylphthalate	1200	490	9, p. A-83; 14, p. 9
			N-Nitrosodiphenylamine	510	490	9, p. A-83; 14, p. 9
			Pentachlorophenol	2500	490	9, p. A-83; 14, p. 9
			Phenanthrene	1100	490	9, p. A-83; 14, p. 9
			Fluoranthene	850	490	9, p. A-83; 14, p. 9
			Pyrene	1600	490	9, p. A-83; 14, p. 9
			Benzo(a)anthracene	500	490	9, p. A-83; 14, p. 9
			Chrysene	920	490	9, p. A-83; 14, p. 9
			Benzo(b)fluoranthene	600	490	9, p. A-83; 14, p. 9
			Heptachlor	25 P	2.5	9, p. A-88; 14, p. 10
			Heptachlor Epoxide	11 P	2.5	9, p. A-88; 14, p. 10
			Endrin	90 P	5.0	9, p. A-88; 14, p. 10
			Endosulfan II	150	5.0	9, p. A-88; 14, p. 10
			Manganese	934	20.7	9, p. C-51; 14, p. 10

D - Diluted sample
P - greater than 25% difference for the detected concentrations between the two columns. The lower of the two results is reported.
* Adjusted CRQL/CRDL for substance (Ref. 19).
**While some of the values were qualified during QC review, the qualifiers only effect the accuracy of the quantification, the presence of these substances is not in doubt.
- Hazardous substances are listed to document the presence of the substance at the source and may be below SQL, however it is above the detection limit.

Source No: 3

2.2.4 HAZARDOUS WASTE QUANTITY

2.4.2.1.1. Hazardous Constituent Quantity

Hazardous Constituent Quantity Assigned Value: 0

2.4.2.1.2. Hazardous Wastestream Quantity

Hazardous Wastestream Quantity Assigned Value: 0

2.4.2.1.3. Volume

Volume Assigned Value: 0

2.4.2.1.4. Area

Description

The area of the source is approximately 225.1 acres (Ref. 14, p. 18).

Source Type	Units (ft^2)	References
Landfill	225.1 acres = 9,805,356 ft^2	Ref. 14, p. 18

Sum (ft^2): 9,805,356 =A
Equation for Assigning Value (Ref. 1, Table 2-5): A/3400

Area Assigned Value: 2883.9

2.4.2.1.5. Source Hazardous Waste Quantity Value

Highest assigned value assigned from Ref. 1, Table 2-5: 2883.9

2.2.1 SOURCE IDENTIFICATION

Name of source: Source R

Number of source: 4

Source Type: Landfill

Description and Location of Source (with reference to a map of the site):

Source R is a former industrial waste landfill situated adjacent to the Mississippi River in Sauget, Illinois (figure 1). The source is located north and west of Source 3 (Q) on the river side (west) of a flood control levee (Ref. 7, p. R-1). Early IEPA files list the source name as the Sauget Toxic Dump (aka: Krummrich Landfill) (Ref. 5, p. 27). More recent reports and files list the source name as the Monsanto Landfill or River's Edge Landfill (Ref. 5, p. 27). The source is owned by Monsanto Chemical Co. and was used by Monsanto for waste disposal between 1957 and 1977 (Ref 5, p. 27). Following the 1973 flood, IEPA sent notices to Sauget & Co. and Monsanto which included notice of inadequate segregation of wastes, and a lack of the necessary permits to operate a disposal facility (Ref. 7, p. R-3, R-8). Source R is covered with a clay cap and vegetated and drainage is directed to ditches around the perimeter of the site (Ref 7, p. R-1). Beginning in 1978, Monsanto restricted access to Source R by fencing and under 24-hour camera surveillance (Ref. 5, pp. 27, 28). There is no documentation that a liner exists to prevent ground water from flowing through the source. Evidence of this flow has been documented as leachate seeps sampled in 1981 showing the presence of metals (Ref. 5, pp. 29, 111).

Containment:

Containment Description	Containment Factor Value	Ref.
Gas release to air:	NS	
Particulate release to air:	NS	
Release to ground water: Although a clay cap was installed in 1979 over the landfill material to prevent infiltration, contaminants are able to travel from the source via ground water. A containment Factor of 10 was assigned due to the lack of evidence of a liner, adequate maintained engineered cover, functioning and maintained run-on control system and runoff management system, or functioning leachate collection and removal system.	10	Ref. 1, Table 3-2 Ref. 5, p. 26
Release via overland migration and/or flood: Overland Flow: As documented from site visits, there is a clay cover, but no evidence of functioning and maintained run-on control system and runoff management system, or a liner with functioning leachate collection and removal system above liner. Flood: There is documentation that containment features at the source are designed to prevent a washout of hazardous substances by flooding. However there is no liner to prevent the flow of ground water through the source. Leachate seeps collected west of the source, along the river bank, document the presence of this flow and the migration of this contamination.	9 10	Ref. 1, Table 4-2 Ref. 5, p. 26 Ref. 1, Table 4-8 Ref. 5, p. 26

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE

- Source Samples:
The following source samples document the presence of the listed hazardous substances in the source. The samples listed in the following table were collected in May 1992, by Geraghty & Miller.

Sample ID	Sample Type	Date	Hazardous Substance	Hazardous Substance Concentration** (µg/kg)	Sample Quantitation Limit* (µg/kg)	Reference
SB14 20-22	Waste	May 1992	Benzene	1500	10	5, p. 24; 24, p. 36
			Toluene	11,000	10	5, p. 24; 24, p. 36
			2,4-Dimethyl phenol	77,000	330	5, p. 24; 24, p. 37
			4-Nitroaniline	180,000	830	5, p. 24; 24, p. 38
			Phenol	2,300,000 D	330	5, p. 24; 24, p. 43
			4-Methyl phenol	420,000 D	330	5, p. 24; 24, p. 43
			Alpha BHC	1100 E	1.7	5, p. 24; 24, p. 39
			Endosulfan I	440	1.7	5, p. 24; 24, p. 39
SB14 30-32	Waste	May 1992	Chloroform	89	10	5, p. 24; 24, p. 49
			1,2-Dichloroethane	160	10	5, p. 24; 24, p. 49
			N-hexane	890 JD		5, p. 24; 24, p. 57
			1,2-Dichlorobenzene	110,000	10	5, p. 24; 24, p. 50
			1,2,4-Trichlorobenzene	51,000	10	5, p. 24; 24, p. 50
			Heptachlor Epoxide	420	1.7	5, p. 24; 24, p. 61
SB15 16-18	Waste	May 1992	2-Butanone	950 JB	10	5, p. 24; 24, p. 71
			4-Methyl, 2-Pentanone	3,500,000 D	10	5, p. 24; 24, p. 75
			Tetra Chloroethane	1200 J	10	5, p. 24; 24, p. 71
			Chlorobenzene	510,000 D	10	5, p. 24; 24, p. 75
			Ethyl benzene	670,000 D	10	5, p. 24; 24, p. 75
			Xylenes (t)	4,800,000 D	10	5, p. 24; 24, p. 64
			Nitrobenzene	340,000 D	330	5, p. 24; 24, p. 80
			1,4-Dichlorobenzene	77,000	10	5, p. 24; 24, p. 70
			2,4,6-Trichlorophenol	1,600,000 D	330	5, p. 24; 24, p. 70
			2,4 Dichlorophenol	10,000,000D	330	5, p. 24; 24, p. 80

Sample ID	Sample Type	Date	Hazardous Substance	Hazardous Substance Concentration** (µg/kg)	Sample Quantitation Limit* (µg/kg)	Reference
			Delta BHC	480	1.7	5, p. 24; 24, p. 70
SB16 16-18	Waste	May 1992	4-Chloroaniline	150,000 D	330	5, p. 24; 24, p. 119
			2,4,6-Trichlorophenol	14,000 D	330	5, p. 24; 24, p. 97
			Heptachlor	17	1.7	5, p. 24; 24, p. 91
			Aldrin	43 D	1.7	5, p. 24; 24, p. 116
			Methoxychlor	130	17	5, p. 24; 24, p. 91
			Endrin Ketone	59	3.3	5, p. 24; 24, p. 91
			Gamma chlordane	43 D	1.7	5, p. 24; 24, p. 116
			4,4-DDE	270 D	3.3	5, p. 24; 24, p. 116
			4,4-DDD	250 D	3.3	5, p. 24; 24, p. 116
SB16 28-30	Waste	May 1992	2-Chlorophenol	1,100,000 D	330	5, p. 24; 24, p. 106
			Pentachlorophenol	43,000 JD	830	5, p. 24; 24, p. 104
			Alachlor	950	830	5, p. 24; 24, p. 110

B - Substance found in blank
D - Diluted sample
E - Estimated value, concentrations exceeded the calibration range of the instrument.
J - Estimated value
* Adjusted CRQL/CRDL for substance (Ref. 19).
**While some of the values were qualified during QC review, the qualifiers only effect the accuracy of the quantification, the presence of these substances is not in doubt.

Source No: 4

2.2.4 HAZARDOUS WASTE QUANTITY

2.4.2.1.1. Hazardous Constituent Quantity

Hazardous Constituent Quantity Assigned Value: 0

2.4.2.1.2. Hazardous Wastestream Quantity

Hazardous Wastestream Quantity Assigned Value: 0

2.4.2.1.3. Volume

Volume Assigned Value: 0

2.4.2.1.4. Area

Description

The area of the source was calculated from the aerial photograph that best outlined the source (3/4/75) (Ref. 22). The photographic scale was determined by measuring equal distances on the USGS 7.5 minute Cahokia Quadrangle and on the aerial photograph. A polar planimeter was used by Illinois EPA staff, to trace the perimeter of the source on the aerial photographs. Three consecutive runs were made over the source and the lowest area value was used (Ref 14, p. 17).

Source Type	Units (ft^2)	References
Landfill	24.75 acres = 1,078,211.17 ft^2	Ref. 14, p. 18

Sum (ft^2): 1,078,211.17 =A
Equation for Assigning Value (Ref. 1, Table 2-5): A / 3400

Area Assigned Value: 317.12

2.4.2.1.5. Source Hazardous Waste Quantity Value

Highest assigned value assigned from Ref. 1, Table 2-5: 317.12

2.2.1 SOURCE IDENTIFICATION

Name of source: Source S

Number of source: 5

Source Type: Landfill

Description and Location of Source:

Source S is depicted on the USGS topographic map as a low-lying feature located to the west of the American Bottoms WWTP (figure 1). The source is currently part of the American Bottoms WWTP property which is situated to the west-southwest of the Source 1 (O) lagoons, on the east side of the flood control levee. The northern portion of Source S is grassed with no apparent features of waste disposal, and the southern portion is covered with gravel and fenced (Ref. 5, p. 33). Disposal boundaries have not been delineated, but it appears that the site was used for drum disposal based on a review of historical aerial photos (Ref. 5, p. 33). Slag material, pesticides, PCBs, VOAs and metals were encountered in borings attempted at Source S. Access to the northern, grassed portion of Source S is partially restricted in that the source is located on private property, and access to the southern portion of Source S is restricted by fencing (Ref. 5, p. 33). At the time of sampling, leachate seeps were present at the surface in the southern portion of the site (Ref. 5, p. 32).

Containment:

Containment Description	Containment Factor Value	Ref.
Gas release to air:	NS	
Particulate release to air:	NS	
Release to ground water: As documented from site inspections, there is no evidence of a liner, adequate maintained engineered cover, functioning and maintained run-on control system and runoff management system, or functioning leachate collection and removal system.	10	Ref. 1, Table 3-2, Ref. 5, p. 32
Release via overland migration and/or flood: Overland Flow: While there is gravel cover, gravel is generally not considered a cover that would prevent contaminant transport. There is also no functioning and maintained run-on control system and runoff management system. Gravel is coarse and porous and would allow water or other liquids to pass through and possibly mobilize the contaminated material and the hazardous substances in it. There is also no indication that the gravel cover is maintained to correct the effects of settling, erosion, and other events. In addition, there is no structure designed to prevent flow onto or into or to control runoff from the source and to prevent hazardous substance migration. As documented from site inspections, there is no evidence of an adequate maintained engineered cover, or functioning and maintained run-on control system and runoff management system, or a liner with functioning leachate collection and removal system above liner. Flood: There is no documentation that containment at the source is designed, constructed, operated, and maintained to prevent a washout of hazardous substances by flood, as evidenced by no impermeable cover, therefore a containment factor of 10 was assigned.	10 10	Ref. 1, Table 4-2 Ref. 5, p. 32 Ref. 1, Table 4-8 Ref. 5, p. 32

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE

- Source Samples:
The following samples document the presence of hazardous substances at the source. Samples X-101-X-106 were collected by Illinois EPA in March 1995 (Ref. 5, pp. 232-236).

Sample ID	Sample Type	Date	Hazardous Substance	Hazardous Substance Concentration (µg/kg) **	Sample Quantitation Limit* (µg/kg)	Reference
X-101	Waste	3/22/95	4,4'-DDT	2.6 J	3.7	5, p. 235; 26, p. 12
X-102	Waste	3/22/95	Isophorone	340 J	388.2	5, p. 233; 26, p. 13
			Fluoranthene	170 J	388.2	5, p. 234; 26, p. 14
X-103	Waste	3/22/95	Dieldrin	4.8	4	5, p. 235; 26, p. 15
			Endrin	24	4	5, p. 235; 26, p. 15
X-105	Waste	3/22/95	Vinyl Chloride	1400	1.1	5, p. 232; 26, p. 17
			Chloroethane	1200 J	1.1	5, p. 232; 26, p. 17
			1,1-Dichloroethane	6500	1.1	5, p. 232; 26, p. 17
			Chloroform	550 J	1.1	5, p. 232; 26, p. 17
			Benzene	1800	1.1	5, p. 232; 26, p. 17
			4-Methyl-2-pentanone	93000	56	5, p. 232; 26, p. 18
			Tetrachloroethene	8600	1.1	5, p. 232; 26, p. 17
			Toluene	990,000	56	5, p. 232; 26, p. 18
			Ethyl benzene	450,000	56	5, p. 232; 26, p. 18
			Total Xylenes	620,000	56	5, p. 232; 26, p. 18
			Naphthalene	200,000	3882	5, p. 232; 26, p. 19
			2-Methylnaphthalene	50,000	3882	5, p. 232; 26, p. 19
			Endosulfan I	26	19.9	5, p. 235; 26, p. 20
			Endosulfan II	120	38.6	5, p. 235; 26, p. 20
			Gamma-chlordane	35	19.9	5, p. 235; 26, p. 20
X-106	Waste	3/22/95	1,2-Dichloroethene	550 J	9.8	5, p. 232; 26, p. 21
			1,1,1-Trichloroethane	12,000	9.8	5, p. 232; 26, p. 21
			Trichloroethene	2800	9.8	5, p. 232; 26, p. 21
			Phenanthrene	81,000	3300	5, p. 234; 26, p. 22
			Di-n-butyl phthalate	1,500,000	82,500	5, p. 234; 26, p. 23
			Pyrene	31,000	3300	5, p. 234; 26, p. 22

Sample ID	Sample Type	Date	Hazardous Substance	Hazardous Substance Concentration (µg/kg) **	Sample Quantitation Limit* (µg/kg)	Reference
			Aroclor-1248	85,000 C	1168.5	5, p. 235; 26, p. 24
			Aroclor-1254	69,000 C	1168.5	5, p. 235; 26, p. 24
			Aroclor-1260	41,000 C	1168.5	5, p. 235; 26, p. 24

C - Lowest concentration reported
J - Estimated value
* Adjusted CRQL/CRDL for substance (Ref. 19).
**While some of the values were qualified during QC review, the qualifiers only effect the accuracy of the quantification, the presence of these substances is not in doubt.

2.2.4 HAZARDOUS WASTE QUANTITY

2.4.2.1.1. Hazardous Constituent Quantity

Hazardous Constituent Quantity Assigned Value: 0

2.4.2.1.2. Hazardous Wastestream Quantity

Hazardous Wastestream Quantity Assigned Value: 0

2.4.2.1.3. Volume

Volume Assigned Value: 0

2.4.2.1.4. Area

Description

The area of the source was calculated from the aerial photograph that best outlined the source (3/4/75) (Ref. 22). The photographic scale was determined by measuring equal distances on the USGS 7.5 minute Cahokia Quadrangle and on the aerial photograph. A polar planimeter was used to trace the perimeter of the source on the aerial photographs. Three consecutive runs were made over the source and the lowest area value was used (Ref 14, p. 17).

Source Type	Units (ft^2)	References
Landfill	10.76 acres = 468,731.39 ft^2	Ref. 14, p. 18

Sum (ft^2): 468,731.39 = A
Equation for Assigning Value (Ref. 1, Table 2-5): A/3400

Area Assigned Value: 137.86

2.4.2.1.5. Source Hazardous Waste Quantity Value

Highest assigned value assigned from Ref. 1, Table 2-5: 137.86

SUMMARY OF SOURCE DESCRIPTIONS

Source No.	Source Hazardous Waste Quantity Value	Source Hazardous Constituent Quantity Complete? (Y/N)	Containment Factor Value by Pathway				
			Ground Water (GW) (Table 3-2)	Surface Water (SW)		Air	
				Overland/flood (Table 4-2)	GW to SW (Table 3-2)	Gas (Table 6-3)	Particulate (Table 6-9)
1 (O)	75,343.75	N	10	9/10	10	NS	NS
2 (P)	366.17	N	10	10/10	10	NS	NS
3 (Q)	2883.9	N	10	10/10	10	NS	NS
4 (R)	317.12	N	10	9/10	10	NS	NS
5 (S)	137.86	N	10	10/10	10	NS	NS

Other sources not scored:

Name of source: **Krummrich/Solutia**

Source Type: Contaminated Soil

Description and Location of Source (with reference to a map of the site):
The W. G Krummrich Plant is the chemical manufacturing facility of Solutia Incorporated located in Sauget, Illinois (Ref. 12, p. 1). Bordered to the north by Monsanto Ave., the south by the Alton and Southern Railroad, and the West by the Terminal Railroad; this wedge shaped property contains approximately 172 acres within its boundaries (figure 1; Ref. 12, p. 1). In 1917 the Monsanto Chemical Co. acquired the former Commercial Acid Company for use as an operating facility. The W. G. Krummrich facility has produced a wide variety of chemicals, both organic and inorganic. According to a 1992 RCRA Facility Assessment Report, the following products and wastes have been or are presently generated at the facility: spent halogenated and non-halogenated solvents, mercury contaminated wastes, chlorobenzenes, nitrochlorobenzenes and benzene compounds, phenols, phosphorus, polychlorinated biphenyl (PCB) compounds, dioxins, aromatic nitro compounds, amines and nitroamines, agent orange, maleic anhydride, acids and caustics (Ref. 12, p. 1). Industrial wastes generated over time at the facility have been deposited within its property boundaries , as well as other landfill sites within the village of Sauget (Ref. 12, p. 1).

Name of source: **Rte. 3 Drum Site**

Source Type: Containers/Drums

Description and Location of Source (with reference to a map of the site):
The Route 3 Drum site is situated in the south west corner of lot F (figure 1), on the east side of the flood control levee. The site is located west of route 3, approximately 500 feet west-southwest of the southwest corner of the W. B. Krummrich plant. The drum site is unlined and was utilized by Monsanto in the mid to late 1940s to bury approximately 5000 55-gallon drums of nitrochlorobenzenes (Ref. 12, p. 2). According to a letter sent to Monsanto by Rollins Environmental Services, there were 4500 drums of Mono nitrochlorobenzenes (0-5%) and Di nitrochlorobenzenes (95-100%); and 500 drums of Mono nitrobiphenyls (65%), Biphenyl (21%) and Unknown substances (14%) (Ref. 21, p. 3). In 1985 Monsanto began to excavate the site in order to remove the drums and send them to be incinerated. Once the operation had begun, it was found that many of the drums were no longer intact, and their contents had mixed with the soil (Ref. 12, p. 2). Instead of removing the source of the contamination, Monsanto chose to have a cap installed over the area, leaving the drums in place (Ref. 12, p. 2).

4.0 SURFACE WATER MIGRATION PATHWAY

Both components of the Surface Water Migration Pathway are presented here and their respective scores are documented.

4.1 OVERLAND/FLOOD MIGRATION COMPONENT

Hazardous substances found in surface waste collected from the sources may mix with runoff during storm events and flow in the direction of the Mississippi River and adjacent wetlands. This migration of hazardous substances poses a threat to the fishery located immediately downstream of the site and to the endangered species and wetlands on and adjacent to the site. Flooding events have already exposed these sensitive environments to hazardous substances, including PCBs. Sediment contamination attributable to the site is present in the Mississippi River adjacent to the site. Discharges of hazardous substances directly into the Mississippi River have also been reported (Ref. 11, pp. 3-6).

4.1.1.1 Definition of Hazardous Substance Migration Path for Overland/flood Component

A levee, which splits this site from north to south, acts as an impedance to overland surface water flow. It does not stop contaminants in the ground water from flowing beneath it to surface water via seeps or direct communication between ground water and the river. Sources located west of the levee, source 3 and 4, are subject to periodic flooding and runoff. The PPE for the hazardous substances in all of the sources, is located along the riverbank, as well as the interface between the Mississippi River and ground water (Ref. 3). The migration pathway continues downstream from the PPE on the Mississippi River for 15 miles, to river mile 162 (Ref. 3).

4.1.2.1 Likelihood of Release

4.1.2.1.1 Observed Release

Observed release by direct observation - flooding
Source 3 and 4 were inundated during the 1993 Mississippi River flood resulting in flood waters in direct contact with hazardous substances (Ref 10, p. 7-8). Pictures taken immediately after the flood event show exposed drums and landfill material from source 3 (Ref. 13, p. 1, 10). Surface soil samples collected from source 3 in 1994 show hazardous substances present at the surface, directly after the 1993 flood. Drum samples taken from drums removed from source 3, show the presence of the hazardous substances as late as December 1999 (Ref. 8, p. B-12-B-16).

- Source 3 (Q)
These samples were collected in 1994, following subsidence of the flood waters after the 1993 event.

Hazardous Substance	Evidence	Concentration (µg/kg)**	CRQL (µg/kg)*	Reference
1,1,1-Trichloroethane	X106	18	12.5	25, p. 26
1,2-Dichloroethene	X101	240	13.5	25, p. 23
2,4-Dimethyl phenol	X107	270J	434.2	25, p. 30
Anthracene	X111	62J	464.8	25, p. 38
Aroclor-1248	X107	4800P	434.2	25, p. 42
Aroclor-1254	X101	110,000 P	22,297.3	25, p. 41
Aroclor-1260	X101	83,000	8,918.9	25, p. 40
Benzene	X101	5J	13.5	25, p. 23
Benzo(a)anthracene	X109	89J	452.1	25, p. 34
Benzo(a)pyrene	X109	84J	452.1	25, p. 34
Benzo(b)fluoranthene	X111	110J	464.8	25, p. 38
Cadmium	X101	2,260	6.7	25, p. 16
Chloroform	X102	10J	11.5	25, p. 24
Chromium	X101	3,650	13.5	25, p. 16
Chrysene	X111	110J	464.8	25, p. 38
Cobalt	X101	18.7	67.4	25, p. 16
Copper	X103	1,630	33.6	25, p. 20
Cyanide	X101	3.3	13.5	25, p. 16
Di-n-butyl phthalate	X110	380J	464.8	25, p. 36
Fluoranthene	X109	160J	452.1	25, p. 34
Isophorone	X107	210J	434.2	25, p. 30
Lead	X101	7,690	4.0	25, p. 16
Manganese	X103	1,270	20.2	25, p. 20
Mercury	X101	4.9	0.270	25, p. 16
Phenanthrene	X109	76J	452.1	25, p. 34
Pyrene	X109	170J	452.1	25, p. 34
Toluene	X105	14	13.5	25, p. 25
Trichloroethene	X101	6J	13.5	25, p. 23
Vanadium	X102	16	64.8	25, p. 18
Xylene	X105	14	13.5	25, p. 25

Hazardous Substance	Evidence	Concentration (µg/kg)**	CRQL (µg/kg)*	Reference
Zinc	X103	9,520	26.9	25, p. 20

Notes:

J - Estimated value

P - greater than 25% difference for the detected concentrations between the two columns. The lower of the two results is reported.

* - For inorganic compounds, µg/L and MDL were used instead of µg/kg and CRQL (Ref. 19).

**While some of the values were qualified during QC review, the qualifiers only effect the accuracy of the quantification, the presence of these substances is not in doubt.

-Drum Samples

These samples were collected between October and December 1999, during the removal of the drums from source 3 (Q).

Hazardous Substance	Evidence	Concentration (mg/kg)*	CRQL(mg/kg)**	Reference
1,1-dichloroethane	D-01	29 J	10	8, p. B-12
1,1,1-trichloroethane	D-01	140	10	8, p. B-12
1,2-dichlorobenzene	D-246	230 J	10	8, p. B-13
1,2-dichloroethene	D-01	160	10	8, p. B-12
1,2,3-trichlorobenzene	D-02	30 J	10	8, p. B-12
1,2,4-trichlorobenzene	D-02	350	10	8, p. B-14
1,2,4-trimethylbenzene	D-246	40,000	10	8, p. B-13
1,3,5-trimethylbenzene	D-246	14,000	10	8, p. B-13
1,4-dichlorobenzene	D-246	30 J	10	8, p. B-14
2-methylnaphthalene	D-112	270 J	330	8, p. B-14
2-methylphenol	D-246	18,600	330	8, p. B-14
2,4-dichlorophenol	D-246	130 J	330	8, p. B-14
2,4-dimethylphenol	D-246	21,400	330	8, p. B-14
2,4,6-trichlorophenol	D-246	34 J	330	8, p. B-14
3,4-methylphenol	D-246	46,200	330	8, p. B-14
4-methyl-2pentanone	D-102	230	10	8, p. B-12
antimony	D-102	60.4	12	8, p. B-15
Aroclor-1248	D-102	1,720	33	8, p. B-16
Aroclor-1254	D-112	2,870	33	8, p. B-16
Aroclor-1260	D-02	1,490	33	8, p. B-16
arsenic	D-01	138	2	8, p. B-15

Hazardous Substance	Evidence	Concentration (mg/kg)*	CRQL(mg/kg)**	Reference
benzene	D-52	6.2 J	10	8, p. B-12
cadmium	D-102	651	1	8, p. B-15
chromium	D-102	7,400	2	8, p. B-15

Hazardous Substance	Evidence	Concentration (mg/kg)*	CRQL(mg/kg)**	Reference
cis-1,2-dichloroethene	D-01	160	10	8, p. B-12
copper	D-02	314	5	8, p. B-15
di-n-butylphthalate	D-102	180 J	330	8, p. B-14
ethylbenzene	D-615	40,000	10	8, p. B-13
isopropylbenzene	D-246	1,400	10	8, p. B-13
lead	D-02	3,740	0.6	8, p. B-15
mercury	D-02	5.84	0.1	8, p. B-15
Methyl ethyl ketone	D-04	10	10	8, p. B-13
n-butylbenzene	D-02	64	10	8, p. B-13
n-propylbenzene	D-246	7,100	10	8, p. B-13
naphthalene	D-395	90,000	330	8, p. B-14
nickel	D-246	403	8	8, p. B-15
p-isopropyltoluene	D-01	88	10	8, p. B-13
phenol	D-246	66,300	330	8, p. B-14
sec-butylbenzene	D-102	55 J	330	8, p. B-13
selenium	D-102	173	1	8, p. B-15
silver	D-02	14.9	2	8, p. B-15
tetrachloroethene	D-01	21 J	10	8, p. B-13
thallium	D-01	10.6	2	8, p. B-15
toluene	D-112	23,000	10	8, p. B-12
trichloroethene	D-112	17,000	10	8, p. B-12
xylene (total)	D-615	58,000	10	8, p. B-12
zinc	D-102	8,870	4	8, p. B-15

Notes:

J- estimated value

*While some of the values were qualified during QC review, the qualifiers only effect the accuracy of the quantification, the presence of these substances is not in doubt.

** Adjusted CRQL/CRDL for substance (Ref. 19).

Observed Release by Chemical Analysis

Sediment samples collected from the Mississippi River adjacent to the site show elevated concentrations of hazardous substances as compared to upstream samples. These hazardous substances are not only found in sources 3 and 4 (Q and R) which are adjacent to the river, but two are also found in Source 2 (P) located on the east side of the levee. The following sediment samples were collected between October 24, 2000 and November 3, 2000, by Solutia, Inc. Background samples were collected immediately upstream of the site to minimize influence from the site. Hazardous substances were not detected in the background samples.

- Background Concentrations:

Sample ID	Sample Medium	Date	Reference
SD-POP-90	Sediment	11/2/2000	23, p. 9, 10, 16
SD-1-50	Sediment	11/1/2000	23, p. 7, 8, 22
SD-1-150	Sediment	11/1/2000	23, p. 7, 8, 22
SD-1-300	Sediment	11/1/2000	23, p. 7, 8, 22, 23

Hazardous Substance	Background Concentrations (µg/L)*				Sample ** Quantitation Limit (µg/L)
	SD-POP-90	SD-1-50	SD-1-150	SD-1-300	
Reference 23	p. 9, 17-20	p. 7, 26, 29, 30, 35	p. 7, 27, 31, 32, 36	p. 7, 28, 33, 34, 37	
Chlorobenzene	ND	ND	ND	ND	7.1
4-Chloroaniline	ND	ND	ND	ND	410
1,4-Dichlorobenzene	ND	ND	ND	ND	410
4,4'-DDD	ND	ND	ND	ND	2.1

The last group of numbers in the sample identification number indicate the distance from the shoreline the sample was collected. Fine sand sediments generally occur within 100 feet of the riverbank and coarse sand is found greater than 100 feet from the bank (Ref. 23, p. 1). There are background and release samples from both types of sediment presented for comparison. The background samples were collected during the same event and under the same conditions as the contaminated samples. None of the hazardous constituents listed below were found in any significant concentration in the upstream samples as indicated by the tables (Ref. 23, p. 1). Areal extent of contaminated sediments in the Mississippi River generally begins upstream near the northern boundary of Source 4 and extends downstream beyond the southern boundary of Source 4. All background samples were collected upstream of Source 4 (Ref. 23, p. 1).

* This data was submitted by the potential responsible parties for regulatory purposes.
** Adjusted CRQL/CRDL for substance (Ref. 19).

- Contaminated Samples:

Sample ID	Sample Medium	Date	Reference
SD-2-50	Sediment	11/1/2000	23, p. 7, 8, 21
SD-2-150	Sediment	11/1/2000	23, p. 7, 8, 21
PD-8-60	Sediment	10/26/2000	23, p. 4-6, 42
PDA-5-R-60	Sediment	10/24/2000	23, p. 4-6, 38
SD-5-150	Sediment	11/3/2000	23, p. 11, 12, 47
SD-5-315	Sediment	11/3/2000	23, p. 11, 12, 47
PDA-2-60	Sediment	10/25/2000	23, p. 4-6, 42
SD-6-90	Sediment	11/3/2000	23, p. 11, 12, 46
SD-7-150	Sediment	11/3/2000	23, p. 13, 14, 48

Hazardous Substance	Evidence	Concentration (µg/kg)*	Background	Detection Limit	Reference
Chlorobenzene	SD-2-50	6.5	ND	5.9	23, p. 7, 24
	SD-2-150	390	ND	300	23, p. 7, 25
	PD-8-60	700	ND	340	23, p. 4, 44
	PDA-5-R-60	450	ND	260	23, p. 4, 39
	SD-5-150	6,700	ND	320	23, p. 11, 51
	SD-5-315	3,100	ND	260	23, p. 11, 50
	PDA-2-60	10,000	ND	1,100	23, p. 4, 43
	SD-6-90	8	ND	5.6	23, p. 11, 49
	SD-7-150	1,600	ND	270	23, p. 13, 52
4-Chloroaniline	PDA-5-R-60	3,300	ND	780	23, p. 4, 40
	PDA-2-60	720	ND	580	23, p. 4, 45
1,4-Dichlorobenzene	SD-5-150	1,700	ND	430	23, p. 11, 53
4,4'-DDD	PDA-5-R-60	14	ND	4.0	23, p. 4, 41

* This data was submitted by the potential responsible parties for regulatory purposes.

These samples also show that 2-chlorophenol, 2,4-dichlorophenol, phenol, delta-BHC, 1,2-dichlorobenzene, 1,2-dichloroethane, xylenes, ethylbenzene, benzene, methoxychlor, and PCBs were found in the river sediments adjacent to the site (Ref. 20, pp. 9-19).

Attribution

All the hazardous substances in the observed release by chemical analysis are present in at least one uncontained source at the site. Sources 1, 2, 3, and 4 were active landfills or sources associated with industrial waste water treatment plants which received waste from the Commercial Acid Company (now called the W. G. Krummrich Plant, a chemical manufacturing facility of Solutia Incorporated) (Refs. 12, p. 1; 14, pp. 1-3). Monsanto has produced a wide variety of chemicals, both organic and inorganic (Ref. 12, p. 1). According to a 1992 RCRA Facility Assessment Report, the following products and wastes have been or are presently generated at the facility: Spent halogenated and non-halogenated solvents, mercury contaminated wastes, chlorobenzenes, nitrochlorobenzenes and benzene compounds, phenols, phosphorus, polychlorinated biphenyl (PCB) compounds, dioxins, aromatic nitro compounds, amines and nitroamines, agent orange, maleic anhydride, acids and caustics (Ref. 12, p. 1). In addition, the landfills contain most of the same hazardous substances which have been found in the release samples in the ground water beneath the landfills. The ground water below the Sauget Area 2 site, appears to be contaminated from sources located on-site. Samples collected from the perimeter of the site do not show elevated levels of contamination like those collected from the main portion of the site (Ref. 14, p. 14).

Hazardous Substances Released

1,1,1-Trichloroethane
1,2 Dichloroethane
1,2-Dichlorobenzene
1,2-Dichloroethene
1,2,3-Trichlorobenzene
1,2,4-Trichlorobenzene
1,2,4-Trimethylbenzene
1,3,5-Trimethylbenzene
2,4-Dimethyl phenol
2,4,6-Trichlorophenol
3,4-Methylphenol
4-Chloroanaline
1,4-Dichlorobenzene
4-Methyl-2-Pentanone
4,4'-DDD
Anthracene
Antimony
Aroclor-1248
Aroclor-1254
Aroclor-1260
Arsenic
Benzene
Benzo(a)anthracene
Benzo(a)pyrene
Benzo(b)fluoranthene
Cadmium
Chlorobenzene
Chloroform
Chromium
Chrysene
cis-1,2-Dichloroethene
Cobalt
Copper
Cyanide
Di-n-butyl phthalate
Ethyl benzene
Fluoranthene
Isophorone
Lead
Manganese
Mercury
n-Butylbenzene
n-Propylbenzene
Nickel
p-Isopropyltoluene
Phenanthrene
Phenol
Pyrene
Sec-butylbenzene
Selenium
Silver
Thallium
Toluene
Trichloroethene
Vanadium
Xylene (total)
Zinc

Surface Water Observed Release Factor Value: 550

4.1.2.3 Drinking Water Threat Targets

There are no documented drinking water targets eligible for scoring.

4.1.3.2 Human Food Chain Threat Waste Characteristics

The Food Chain Threat is being scored because people have been known to fish in the vicinity of the site. According to the Illinois Department of Conservation (IDOC), the Resource Inventory for the Mississippi River at river miles 178-162 shows fishing areas as well as sport fishing areas in this reach (Ref. 6, p. 5-5).

4.1.3.2.1 Toxicity/Persistence/Bioaccumulation

Hazardous Substance	Source No.	Toxicity Factor Value	Persistence Factor Value*	Toxicity/ Persistence Factor Value (Table 4-16)	Bio-accumulation Value**	Ref.
1,1,1-Trichloroethane	5, OR	1	.4	.4	5	2, p. B-19
1,2 Dichloroethane	4	100	.4	40	5	2, p. B-7
1,2-Dichlorobenzene	4, OR	10	.4	4	50	2, p. B-7
1,2,4-Trichlorobenzene	3, 4, OR	100	.4	40	500	2, p. B-19
1,4-Dichlorobenzene	2, 4, OR	10	.4	.4	50	2, p. B-7
2-Butanone	4	10	.4	4	.5	2, p. B-13
2-Chlorophenol	4	100	.4	40	500	2, p. B-5
2-Methyl naphthalene	3, 5, OR	NA	.4	ND	5000	2, p. B-14
2,4-Dichlorophenol	4, OR	1000	.0007	.7	50	2, p. B-8
2,4-Dimethyl phenol	4, OR	100	1	100	500	2, p. B-8
2,4,6-Trichlorophenol	4, OR	10	1	10	500	2, p. B-20
4 - Nitroaniline	4	1	.4	.4	5	2, p. B-15
4-Chloroaniline	2, 3, 4, OR	1000	.07	70	5	2, p. B-5
4-Methyl-2-Pentanone	4, 5, OR	100	.4	40	5	2, p. B-13
4-Methyl phenol	2, 4	100	.4	40	5	2, p. B-6
4,4'-DDD	3, 4, OR	100	1	100	50,000	2, p. B-6
4,4'-DDE	2, 3, 4	100	1	100	50,000	2, p. B-6
4,4'-DDT	3, 5	1000	1	1000	50,000	2, p. B-6
Aldrin	2, 4	10,000	1	10,000	50,000	2, p. B-1
Alpha-BHC	4, OR	10,000	1	10,000	500	2, p. B-12
Anthracene	OR	10	1	10	5,000	2, p. B-2
Aroclor-1016	3	10,000	1	10,000	50,000	2, p. B-16
Aroclor-1232	3	10,000	1	10,000	50,000	2, p. B-16
Aroclor-1242	2, 3	10,000	1	10,000	50,000	2, p. B-16

Hazardous Substance	Source No.	Toxicity Factor Value	Persistence Factor Value*	Toxicity/ Persistence Factor Value (Table 4-16)	Bio-accumulation Value**	Ref.
Aroclor-1248	2, 3, 5, OR	10,000	1	10,000	50,000	2, p. B-16
Aroclor-1254	2, 3, 5, OR	10,000	1	10,000	50,000	2, p. B-16
Aroclor-1260	3, 5, OR	10,000	1	10,000	50,000	2, p. B-16
Arsenic	OR	10,000	1	10,000	5	2, p. B-2
Barium	3	10,000	1	10,000	5	2, p. B-2
Benzene	2, 3, 4, 5, OR	100	.4	40	5000	2, p. B-2
Benzo(a)pyrene	OR	10,000	1	10,000	50,000	2, p. B-2
Benzo(a)anthracene	3, OR	1,000	1	1,000	50,000	2, p. B-2
Benzo(b)fluoranthene	3, OR	100	1	100	50,000	2, p. B-3
Beryllium	3	10,000	1	50	50	2, p. B-3
Cadmium	3, OR	10,000	1	10,000	5000	2, p. B-4
Chlorobenzene	3, 4, OR	100	.0007	.07	50	2, p. B-5
Chloroform	4, 5, OR	100	.4	40	5	2, p. B-5
Chromium	2, 3, OR	10,000	1	10,000	5	2, p. B-5
Chrysene	3, OR	10	1	10	500	2, p. B-5
Cobalt	3, OR	1	1	1	5	2, p. B-6
Copper	2, 3, OR	NA	1	ND	50,000	2, p. B-6
Cyanide	OR	100	.4	40	5	2, p. B-6
Delta-BHC	3, 4	1	1	1	500	2, p. B-12
Di-n-butyl phthalate	5, OR	10	1	10	5000	2, p. B-7
Dieldrin	5	10,000	1	10,000	50,000	2, p. B-8
Diethylphthalate	3	1	1	1	500	2, p. B-8
Endosulfan I	2, 3, 4, 5	100	1	100	500	2, p. B-9
Endosulfan II	2, 3, 5	100	1	100	500	2, p. B-9
Endosulfan sulfate	3	100	1	100	500	2, p. B-9
Endrin	3, 5	10,000	1	10,000	5000	2, p. B-10
Endrin aldehyde	3, 5	NA	.4	NA	500	2, p. B-10
Endrin ketone	4	100	.4	40	5	2, p. B-10
Ethyl benzene	2, 3, 4, 5, OR	10	.4	4	50	2, p. B-10
Fluoranthene	3, 5, OR	100	1	100	5,000	2, p. B-10
Gamma-BHC	3	10,000	1	10,000	500	2, p. B-13
Gamma-chlordane	3, 4, 5	10	1	10	50,000	2, p. B-4

Hazardous Substance	Source No.	Toxicity Factor Value	Persistence Factor Value*	Toxicity/ Persistence Factor Value (Table 4-16)	Bio-accumulation Value**	Ref.
Heptachlor	3, 4	1000	1	1000	5000	2, p. B-11
Heptachlor epoxide	3, 4	10,000	1	10,000	5	2, p. B-11
Isophorone	5, OR	10	1	10	5	2, p. B-13
Lead	2, 3, OR	10,000	1	10,000	50	2, p. B-13
Manganese	1, 3, OR	10,000	1	10,000	.5	2, p. B-13
Mercury	OR	10,000	.4	4000	50,000	2, p. B-13
Methoxychlor	4	100	1	100	50,000	2, p. B-13
N - Hexane	4	10	.4	4	500	2, p. B-12
N-Nitrosodiphenylamine	3	10	1	10	500	2, p. B-15
Napthalene	3, 5, OR	100	.4	40	500	2, p. B-14
Nickel	2, 3, OR	10,000	1	10,000	.5	2, p. B-14
Nitrobenzene	4	1000	1	1000	5	2, p. B-15
Pentachlorophenol	3, 4	100	1	100	500	2, p. B-16
Phenanthrene	3, 5, OR	NA	1	ND	50	2, p. B-16
Phenol	2, 3, 4, OR	1	1	1	5	2, p. B-16
Pyrene	3, 5, OR	100	1	100	50	2, p. B-17
Silver	OR	100	1	100	50	2, p. B-18
Tetra Chloroethane	4	10	1	10	5	2, p. B-18
Toluene	2, 3, 4, 5, OR	10	.4	4	50	2, p. B-19
Trichloroethene	5, OR	10	.4	4	50	2, p. B-19
Vanadium	1, 2, 3, OR	100	1	100	.5	2, p. B-20
Xylene (total)	2, 3, 4, 5, OR	1	.4	.4	50	2, p. B-20
Zinc	2, 3, OR	10	1	10	500	2, p. B-20

Notes:

* Persistence value for Rivers

** Bioaccumulation factor value for freshwater

The hazardous substances with the highest Toxicity/Persistence/Bioaccumulation value are:

Aldrin
Aroclor-1016
Aroclor-1232
Aroclor-1242
Aroclor-1248
Aroclor-1254
Aroclor-1260
Benzo(a)pyrene
Dieldrin

Toxicity/Persistence/Bioaccumulation Factor Value: 5×10^8

4.1.3.2.2 Hazardous Waste Quantity

Source No.	Source Type	Source Hazardous Waste Quantity
3 (Q)	Landfill	2883.9
4 (R)	Landfill	317.12

Sum of Values: 3201.02

Hazardous Waste Quantity Factor Value: 100
(Ref. 1, Table 2-6)

4.1.3.2.3 Waste Characteristics Factor Category Value

Toxicity/Persistence Factor Value: 10,000
Hazardous Waste Quantity Factor Value: 100
Bioaccumulation value: 50,000

Toxicity/Persistence Factor Value x Hazardous Waste Quantity Factor Value: 1×10^6
($10,000 \times 100 = 1 \times 10^6$)
(max 1×10^8)

Bioaccumulation potential factor value x
(Toxicity/Persistence Factor Value x Hazardous Waste Quantity Factor Value) : 5×10^{10}
($50,000 \times 1 \times 10^6 = 5 \times 10^{10}$)
(Max 1×10^{12})

Waste Characteristics Factor Category Value: 320
(Ref. 1, Table 2-7)

4.1.3.3 Human Food Chain Threat Targets

Actual Human Food Chain Contamination
Hazardous substances having a bioaccumulation potential factor value of 500 or greater were present in the observed release by direct observation and by chemical analysis of sediment samples. A portion of the Mississippi River Fishery is also located within the area of direct observation, therefore the fishery is subject to actual contamination (figure 1; Refs. 1, Sec. 4.1.3.3; 28, p. 1). The hazardous substances released during the 1993 flood and identified by the chemical analysis of sediments, are listed previously in section 4.1.2.1.1 of this document.

Level I Concentrations
No level I concentrations have been identified for the Human Food Chain Threat.

Level II Concentrations
Actual contamination has been established for the Mississippi River fishery by Direct Observation, and chemical analysis of sediment samples (Ref. 1, Sec. 4.1.3.3)

Most Distant Level II Sample
Sample ID: SD-7-150
Distance from the PPE: Sample located approximately 2000 feet downstream from uppermost PPE
Reference: 23, pp. 4, 1-18, 1-19

Level II Fisheries

Identity of Fishery	Extent of Level II Fishery (Relative to PPE)	Refs.
Mississippi River	2000 feet	3, map 1; 28

4.1.3.3.1 *Food Chain Individual*

Level I/Level II/or Potential: Level II
Hazardous Substance: PCBs
Bioaccumulation Potential: 50,000

Level II contamination can be established for the portion of the fishery located between the northern most boundary of the site and sample SD-7-150 (figure 1; Ref. 23, p. 4).

Identity of Fishery	Type of Surface Water Body	Dilution Weight (D_i) (Table 4-13)	Refs.
Mississippi River	Very Large River	0.00001	27, p. 3

Food Chain Individual Factor Value: 45

4.1.3.3.2 Population

The Sauget Area 2 site is located along the Illinois bank of the Mississippi River at river mile 178 (Ref. 3, p. 1). Although the entire river is fished, the river adjacent to and immediately downstream of the site is mostly bank fished. Many species exist within the river, however, the most popular are catfish, drum and carp (Ref. 28, p. 1). While it is known that the area is used as a fishery, the exact number of fish caught every year is unknown (Ref. 28, p. 1). Therefore, greater than zero pounds has been assigned to the annual production category for scoring purposes.

4.1.3.3.2.2 Level II Concentrations

Identity of Fishery	Annual Production (pounds)	References	Human Food Chain Population Value (Table 4-18)
Mississippi River	> 0	28	0.03

Level II Concentrations Factor Value: 0.03

4.1.4.2 Environmental Threat Waste Characteristics

Hazardous substances in the soil and ground water at the site pose a threat to the wetlands on site and adjacent to the Mississippi River and the endangered species who inhabit the area.

4.1.4.2.1 Ecosystem Toxicity/Persistence/Bioaccumulation

Hazardous Substance	Source No.	Ecosystem Toxicity Factor Value	Persistence Factor Value*	Ecosystem Toxicity/ Persistence Factor Value (Table 4-21)	Bio-accumulation Value**	Ref.
1,1,1-Trichloroethane	5, OR	10	.4	4	5	2, p. B-19
1,2 Dichloroethane	4	1	.4	.4	5	2, p. B-7
1,2-Dichlorobenzene	4, OR	100	.4	40	50	2, p. B-7
1,2,4-Trichlorobenzene	3, 4, OR	1,000	.4	400	500	2, p. B-19
1,4-Dichlorobenzene	2, 4, OR	100	.4	40	50	2, p. B-7
2-Chlorophenol	4	100	.4	40	500	2, p. B-5
2-Methyl naphthalene	3, 5, OR	1,000	.4	400	5,000	2, p. B-14
2,4-Dichlorophenol	4, OR	100	.0007	.07	500	2, p. B-8
2,4-Dimethyl phenol	4, OR	100	1	100	500	2, p. B-8
2,4,6-Trichlorophenol	4, OR	1,000	1	1,000	50,000	2, p. B-20
4 - Nitroaniline	4	10	.4	4	5	2, p. B-15
4-Chloroaniline	2, 3, 4, OR	10,000	.07	700	5	2, p. B-5
4,4'-DDD	3, 4, OR	10,000	1	10,000	50,000	2, p. B-6
4,4'-DDE	2, 3, 4	10,000	1	10,000	50,000	2, p. B-6
4,4'-DDT	3, 5	10,000	1	10,000	50,000	2, p. B-6
Aldrin	2, 4	10,000	1	10,000	50,000	2, p. B-1
Alpha-BHC	4	100	1	100	500	2, p. B-12
Anthracene	OR	10,000	1	10,000	5,000	2, p. B-2
Aroclor-1016	3	10,000	1	10,000	50,000	2, p. B-16
Aroclor-1232	3	10,000	1	10,000	50,000	2, p. B-16
Aroclor-1242	2, 3	10,000	1	10,000	50,000	2, p. B-16
Aroclor-1248	2, 3, 5, OR	10,000	1	10,000	50,000	2, p. B-16
Aroclor-1254	2, 3, 5, OR	10,000	1	10,000	50,000	2, p. B-16
Aroclor-1260	3, 5, OR	10,000	1	10,000	50,000	2, p. B-16
Arsenic	OR	10	1	10	500	2, p. B-2
Barium	3	1	1	1	.5	2, p. B-2
Benzene	2, 3, 4, 5, OR	100	4	40	500	2, p. B-2

Hazardous Substance	Source No.	Ecosystem Toxicity Factor Value	Persistence Factor Value*	Ecosystem Toxicity/ Persistence Factor Value (Table 4-21)	Bio-accumulation Value**	Ref.
Benzo(a)pyrene	OR	10,000	1	10,000	50,000	2, p. B-2
Benzo(a)anthracene	3, OR	10,000	1	10,000	50,000	2, p. B-2
Benzo(b)fluoranthene	3, OR	NA	1	ND	50,000	2, p. B-3
Beryllium	3	NA	1	ND	50	2, p. B-3
Beta-BHC	5	NA	1	ND	500	2, p. B-12
Cadmium	3, OR	1,000	1	1,000	5,000	2, p. B-4
Chlorobenzene	3, 4, OR	1,000	.0007	.7	50	2, p. B-5
Chloroform	4, 5, OR	10	.4	4	5	2, p. B-5
Chromium	2, 3, OR	100	1	100	5	2, p. B-5
Chrysene	3, OR	1,000	1	1,000	5,000	2, p. B-5
Cobalt	3, OR	NA	1	ND	5,000	2, p. B-6
Copper	2, 3, OR	100	1	100	50,000	2, p. B-6
Cyanide	OR	1,000	.4	400	.5	2, p. B-6
Delta-BHC	3, 4	NA	1	ND	500	2, p. B-12
Di-n-butyl phthalate	5, OR	1,000	1	1,000	5,000	2, p. B-7
Dieldrin	5	10,000	1	10,000	50,000	2, p. B-8
Diethylphthalate	3	10	1	10	500	2, p. B-8
Endosulfan I	2, 3, 4, 5	10,000	1	10,000	50,000	2, p. B-9
Endosulfan II	2, 3, 5	10,000	1	10,000	50,000	2, p. B-9
Endosulfan sulfate	3	NA	1	ND	500	2, p. B-9
Endrin	3, 5	10,000	1	10,000	50,000	2, p. B-10
Endrin aldehyde	3, 5	NA	.4	ND	500	2, p. B-10
Endrin ketone	4	NA	.4	ND	.5	2, p. B-10
Ethyl benzene	2, 3, 4, 5, OR	100	.4	40	50	2, p. B-10
Fluoranthene	3, 5, OR	10,000	1	10,000	500	2, p. B-10
Gamma-chlordane	3, 4, 5	10,000	1	10,000	500	2, p. B-4
Heptachlor	3, 4	10,000	1	10,000	50,000	2, p. B-11
Heptachlor epoxide	3, 4	10,000	1	10,000	50,000	2, p. B-11
Isophorone	5, OR	1	1	1	5	2, p. B-13
Lead	2, 3, OR	1,000	1	1,000	5,000	2, p. B-13
Manganese	1, 3, OR	NA	1	ND	50,000	2, p. B-13
Mercury	OR	10,000	.4	4,000	50,000	2, p. B-13

Hazardous Substance	Source No.	Ecosystem Toxicity Factor Value	Persistence Factor Value*	Ecosystem Toxicity/ Persistence Factor Value (Table 4-21)	Bio-accumulation Value**	Ref.
Methoxychlor	4	10,000	1	10,000	50,000	2, p. B-13
N - Hexane	4	100	.4	40	500	2, p. B-12
N-Nitrosodiphenylamine	3	100	1	100	500	2, p. B-15
Naphthalene	3, 5, OR	1,000	.4	400	500	2, p. B-14
Nickel	2, 3, OR	10	1	10	500	2, p. B-14
Nitrobenzene	4	100	1	100	5	2, p. B-15
Pentachlorophenol	3, 4	100	1	100	5,000	2, p. B-16
Phenanthrene	3, 5, OR	1,000	1	1,000	5,000	2, p. B-16
Phenol	2, 3, 4, OR	10,000	1	10,000	5	2, p. B-16
Pyrene	3, 5, OR	10,000	1	10,000	50	2, p. B-17
Silver	OR	10,000	1	10,000	50	2, p. B-18
Tetra Chloroethane	4	100	1	100	5	2, p. B-18
Toluene	2, 3, 4, 5, OR	100	.4	40	50	2, p. B-19
Vanadium	1, 2, 3, OR	NA	1	ND	.5	2, p. B-20
Xylene (total)	2, 3, 4, 5, OR	100	.4	40	50	2, p. B-20
Zinc	2, 3, OR	10	1	10	500	2, p. B-20

Notes:

* Persistence value for Rivers

** Environmental Bioaccumulation factor value for freshwater

The substances which document the highest Ecosystem Toxicity/Persistence/Bioaccumulation value include:

4,4'-DDD
4,4'-DDE
4,4'-DDT
Aldrin
Aroclor-1016
Aroclor-1232
Aroclor-1242
Aroclor-1248
Aroclor-1254
Aroclor-1260
Benzo(a)pyrene
Benzo(a)anthracene
Dieldrin
Endosulfan I
Endosulfan II
Endrin
Heptachlor
Heptachlor epoxide
Methoxychlor

Ecosystem Toxicity/Persistence/Bioaccumulation Factor Value: 5×10^8

4.1.4.2.2. Hazardous Waste Quantity

Source No.	Source Type	Source Hazardous Waste Quantity
3 (Q)	Landfill	2883.9
4 (R)	Landfill	317.12

Sum of Values: 3201.02

Hazardous Waste Quantity Factor Value: 100
(Ref. 1, Table 2-6)

4.1.4.2.3. Waste Characteristics Factor Category Value

Ecosystem Toxicity/Persistence Factor Value: 10,000
Hazardous Waste Quantity Factor Value: 100
Bioaccumulation value: 50,000

Ecosystem Toxicity/Persistence Factor Value x Hazardous Waste Quantity Factor Value: 1×10^6
($10,000 \times 100 = 1 \times 10^6$)
(max 1×10^8)

Ecosystem Bioaccumulation potential factor value x
(Ecosystem Toxicity/Persistence Factor Value x Hazardous Waste Quantity Factor Value) : 5×10^{10}
($50,000 \times 1 \times 10^6 = 5 \times 10^{10}$)
(Max 1×10^{12})

Waste Characteristics Factor Category Value: 320
(Ref. 1, Table 2-7)

4.1.4.3 Environmental Threat Targets

Environmental targets include sensitive habitats for six threatened or endangered species of birds and wetlands located within source 4. These species were identified by the Illinois Department of Natural Resources as nesting or foraging within the Sauget Area 2 site (Ref. 15, p. 2). The Palustrine wetlands were identified by the Illinois Department of Conservation (Ref. 20, p. 14). The wetlands in Source 3 contain vegetation consistent with that found in wetlands of this type, such as the Eastern Cottonwood, Black Willow, Water Plantain and Potamogeton nodosus (Ref. 20, p. 5, 14, 15, 20).

Most Distant Level II Sample
Sample ID: SD-7-150
Distance from the PPE: Sample located approximately 2000 feet downstream from uppermost PPE
Reference: 23, pp. 4, 1-18, 1-19

4.1.4.3.1 Sensitive Environments

4.1.4.3.1.1. Level I Concentrations

No level I concentrations have been identified for the Environmental Threat.

4.1.4.3.1.2. Level II Concentrations

Actual contamination has been established for the Mississippi River fishery by Direct Observation, therefore Level II Contamination has been assigned (Ref. 1, Sec. 4.1.4.3.1)

Sensitive Environments

Type of Surface Water Body	Sensitive Environment *	References	Sensitive Environment Value (Table 4-23)
Wetlands	Bald Eagle Habitat	15, p. 2; 29, p. 1	75 - Federal threatened
Wetlands	Common Moorhen Habitat	15, p. 2; 29, p. 5	50 - State threatened
Wetlands	Black-crowned Night Heron Habitat	15, p. 2; 29, p. 6	50 - State endangered
Wetlands	Snowy Egret Habitat	15, p. 2; 29, p. 6	50 - State endangered
Wetlands	Little Blue Heron Habitat	15, p. 2; 29, p. 6	50 - State endangered
Wetlands	Yellow-crowned Night Heron Habitat	15, p. 2; 29, p. 6	50 - State endangered

* There is no documentation indicating the presence of endangered or threatened plants in the area. It is unclear if this omission is due to the lack of documentation of plant species or the lack of sensitive species within the area.

Sum of Level II Sensitive Environments Value: 325

Wetlands

Type of Surface Water Body	Wetland Frontage (miles)	References	Wetlands Value (Table 4-24)
Very Large River	3.2 mi*	Figure 1; 20, p. 14	100

* This number was determined by measuring the perimeter of the wetland located in Source 3 (Figure 1). Most of the Source contains soils that have been classified as those found in wetlands (Ref. 1, Section 4.1.4.3.1.2; 20, p. 14, 15).

Sum of Level II Sensitive Environments Value + Wetlands Value: 425

Environmental Threat Targets Factor Category Value: 425

4.2 Ground Water to Surface Water Migration Component

The ground water located beneath the site is contaminated with hazardous substances linked to the sources at the surface. This ground water, as explained below, is allowed to flow freely below the site and the levee, toward the Mississippi River during times of normal and low flow (Ref. 17, p. F-1). This migration of hazardous substances poses a potential threat to the fishery located immediately downstream of the site and to the endangered species and wetlands on and adjacent to the site.

4.2.1.2 Definition of Hazardous Substance Migration Path for Ground Water to Surface Water Component

The levee stops direct overland flow from the source areas on the east side of the levee from reaching the river and stops the flooding of the river from reaching them. However, the sand levee does not stop migration of subsurface water and allows hazardous substances, from the sources on the east side of the levee, to migrate under and through the levee to the river either directly or via seeps and overland flow. Leachate seeps have been identified near the river edge as evidence of this flow (Ref. 7, p. R-15). As stated in the HRS, to be an eligible ground water to surface water migration pathway, a portion of the surface water must be within 1 mile of one or more sources at the site having a ground water containment factor value greater than 0 (Ref. 1, sec. 3.1.2.1, 4.2.1.1). As documented earlier in this report, all five sources at the site have containment factors greater than 0 and are all located within 1 mile of the Mississippi River (Ref. 3, p. 1). Also, there are to be no discontinuities between the upper most aquifer and the surface water, and the uppermost aquifer must be at or above the bottom of the surface water (Ref. 1, sec. 4.2.1.1). As stated below, the ground water at the site is in direct contact with the Mississippi River, and even reverses flow during elevated river stages (Ref. 17, p. F-2).

4.2.2.1 Likelihood of Release

To establish an observed release to the ground water to surface water component of the surface water pathway, an observed release to the ground water pathway must first be established (Ref. 1, Sec. 4.2.1.3). The following section describes the contaminated aquifer and documents evidence of an observed release to the ground water pathway by chemical analysis. The ground water below the Sauget Area 2 site, is contaminated from sources located on-site. Samples collected from the perimeter of the site do not show elevated levels of contamination like those collected from the main portion of the site (Ref. 14, p. 14). It is believed that contamination from each of the sources has combined in the ground water to form a plume which can not be identified with a single source. Due to the link between the ground water in the area of the site and the surface water, as shown below, it is also believed that the contamination found in the Mississippi River sediments was deposited by the migration of ground water.

4.2.2.1.1 Observed Release to Ground Water

Strata Being Evaluated:

The hydrogeology in the Sauget area is characterized primarily by glacial and alluvium deposits overlying bedrock. The depth of the alluvial deposits in the St. Louis District is rather variable, ranging from about 75 to 200 feet, with an average depth of about 125 feet (Ref. 18, p. 12). These unconsolidated deposits have been split into 3 zones of transmissivities to simplify the flow system (Ref. 16, p. 3). The surficial deposit of unconsolidated alluvium, the Cahokia Alluvium, extends 40 feet below the surface. This alluvium has been described as poorly sorted, fine-grained, gray and brown silty sand with local sand and clay lenses (Ref. 16, p. 3). This has also been named the water-table zone of the aquifer system (Ref. 16, p. 3-4). The water-table zone reaches downward approximately 30 feet to the top of the Henry Formation (Ref. 16, p. 4). Flow within the water-table zone is generally westward toward the river, except for a slight mound below Source 4 (R) which causes flow to be south-easterly until it is overtaken by the westward gradient (Ref. 17, p. F-1, F-2).

Prior to 1980, ground water movement was mainly away from the river toward plant process area production wells used by local industries, including the Monsanto-Krummrich facility. However, when these wells were abandoned, natural flow conditions resumed in the direction of the Mississippi River (Ref. 16, p. 6). Ground water movement in this region is westward, toward the Mississippi River during normal river stage in all three zones (Ref. 17, p. F-1). During normal river stages, the Mississippi river is a major ground water discharge boundary for the aquifer. During high river stages (when the water level in the river rises above the ground water table), ground water flow becomes

reversed. Ground water flows eastward until it reaches an equal westward regional gradient. This stagnation point is generally between Source 4 (R) and the levee, depending on the magnitude of the westward flow and the river stage (Ref. 17, p. F-2). The levee, which splits this site from north to south, may act as an impedance to surface water flow, it does not stop contaminants in the ground water from flowing beneath it to surface water via seeps or direct communication between ground water and the river. During normal conditions, the hazardous substances may migrate through and below the surficial levee from Sources 1, 2, 5, and 6 (O, P, and S).

Chemical Analysis

Ground water samples documenting an observed release were taken at the site in May of 1999. These samples were taken between 8 and 28 feet below the surface* in the Cahokia Alluvium and the watertable zone of the ground water.

- Background Concentrations:
The background samples were collected at the same time as the release samples and are located up gradient of the release samples (Ref. 14, p. 14). Background samples have been included to determine the extent of the plume and to show that elevated levels of hazardous substances are not emanating from another source off-site or found naturally in the area.

Sample ID	Screened Interval (feet bgs)*	Date	Reference
G108	16 - 20	5-25-99	14, p. 14, 21
G 109	17 - 19	5-27-99	14, p. 15, 21
G101	18 - 20	5-10-99	12, p. 9, 11

* Elevation in the vicinity of the site is approximately 400 feet above sea level and varies within 5 feet on either side of the levee. Therefore, the difference in the elevation of the wells is insignificant with respect to the screened intervals. The levee itself is 12 to 18 feet higher than the surrounding area; however, there were no samples taken from the levee (Ref. 3).

Hazardous Substance	Background Concentrations (µg/L)			Sample Quantitation Limit (µg/L)*	Reference
	G108 (Ref. 14, p. 14)	G109 (Ref. 14, p. 15)	G101 (Ref. 12, p. 9)		
1,1,1-Trichloroethane	ND	ND	ND	10	9, p. B-58, B-64, D-11
1,2-Dichlorobenzene	ND	ND	19	10	9, p. B-60, B-66, D-12
1,4-Dichlorobenzene	ND	ND	ND	10	9, p. B-60, B-66, D-12
2,4,6-Trichlorophenol	ND	ND	ND	10	9, p. B-60, B-66, D-12
2,4-Dichlorophenol	ND	ND	ND	10	9, p. B-60, B-66, D-12
2,4-Dimethyl phenol	ND	ND	ND	10	9, p. B-60, B-66, D-12
2-Butanone	ND	ND	ND	10	9, p. B-58, B-64, D-11
2-Chlorophenol	ND	ND	ND	10	9, p. B-60, B-66, D-12
2-Methylnaphthalene	ND	ND	ND	10	9, p. B-60, B-66, D-12
4,4'-DDE	.015 J (.15)	.0044J (.044)	ND	0.1	9, p. B-63, B-69, D-15

Hazardous Substance	Background Concentrations (µg/L)			Sample Quantitation Limit (µg/L)*	Reference
	G108 (Ref. 14, p. 14)	G109 (Ref. 14, p. 15)	G101 (Ref. 12, p. 9)		
4,4'-DDT	ND	ND	ND	0.1	9, p. B-63, B-69, D-15
4-Chloroaniline	ND	ND	ND	10	9, p. B-60, B-66, D-12
4-Methyl-2-Pentanone	ND	ND	ND	10	9, p. B-58, B-64, D-11
4-Methyl phenol	ND	ND	ND	10	9, p. B-60, B-66, D-12
4-Nitroaniline	ND	ND	ND	25	9, p. B-61, B-67, D-13
Aldrin	ND	ND	ND	0.05	9, p. B-63, B-69, D-15
Aroclor-1242	ND	.32J (**3.2**)	ND	1	9, p. B-63, B-69, D-15
Aroclor-1248	ND	.2J (**2**)	ND	1	9, p. B-63, B-69, D-15
Aroclor-1254	.55 J (**5.5**)	ND	ND	1	9, p. B-63, B-69, D-15
Benzene	ND	ND	ND	10	9, p. B-58, B-64, D-11
Chlorobenzene	ND	ND	ND	10	9, p. B-58, B-64, D-11
Chloroform	ND	ND	ND	10	9, p. B-58, B-64, D-11
Delta-BHC	ND	ND	ND	0.05	9, p. B-63, B-69, D-15
Diethylphthalate	ND	ND	ND	10	9, p. B-61, B-67, D-13
Di-n-butyl phthalate	ND	ND	ND	10	9, p. B-61, B-67, D-13
Endosulfan I	.0018 J (**.018**)	ND	ND	.05	9, p. B-63, B-69, D-15
Ethyl benzene	ND	ND	ND	10	9, p. B-58, B-64, D-11
Gamma-BHC (lindane)	ND	ND	ND	0.05	9, p. B-63, B-69, D-15
Lead	19	15.8	**50**	3	9, p. C-11, C-12, D-16
Manganese	**2,480**	273	1,520	15	9, p. C-11, C-12, D-16
Naphthalene	ND	ND	ND	10	9, p. B-60, B-66, D-12
Nickel	23.9 B	15.2 B	**86.6**	40	9, p. C-11, C-12, D-16
Nitrobenzene	ND	ND	ND	10	9, p. B-60, B-66, D-12
Pentachlorophenol	ND	ND	ND	25	9, p. B-61, B-67, D-13
Phenol	ND	ND	ND	10	9, p. B-60, B-66, D-12
Toluene	ND	ND	ND	10	9, p. B-58, B-64, D-11
Xylene (total)	ND	ND	ND	10	9, p. B-58, B-64, D-11

Notes:

J - Estimated value

B- Substance appears in blank

* Adjusted CRQL/CRDL for substance (Ref. 19).

-Concentrations in bold are the highest background value and were used for comparison with the contaminated samples.

( ) - Concentrations in parentheses are the bias corrected values (Ref. 30).

- Contaminated Samples:

Sample ID	Screened Interval (feet bgs)*	Date	Reference
G 101	20 - 24	5-24-99	14, p. 14, 21
G 102	21 - 23	5-24-99	14, p. 14, 21
G 104	24 - 28	5-26-99	14, p. 14, 21
G 106	16 - 18	5-27-99	14, p. 14, 21
G 107	20 - 24	5-27-99	14, p. 14, 21
G 110	24 - 28	5-26-99	14, p. 15, 22
G 111	16.5 - 18.5	5-24-99	14, p. 15, 22
G 112	18 - 20	5-25-99	14, p. 15, 22
G 113	8 - 12	5-25-99	14, p. 15, 22
G 114	16 - 20	2-25-99	14, p. 15, 22
G 116	17 - 19	5-26-99	14, p. 15, 22
G 117	16 - 20	5-27-99	14, p. 15, 22

* Elevation in the vicinity of the site varies within 5 feet on either side of the levee and is in the range of 400-410 feet. Therefore, the difference in the elevation of the wells is insignificant with respect to the screened intervals. The levee itself is 12 to 18 feet higher than the surrounding area, however there were no samples taken from the levee (Ref. 3).

- Contaminated samples

Hazardous Substance	Contaminated Samples		Sample Quantitation Limit (µg/L)*	Highest Background Concentration (µg/L)**	References
	Sample ID:	Concentration (µg/L)			
Chloroform	G 104	150 J (15)	200	ND	9, p. B-33; 14, p. 14
1,1,1-Trichloroethane	G 111	11	10	ND	9, p. B-76; 14, p. 15
4-Methyl-2-Pentanone	G 101	18	10	ND	9, p. B-5; 14, p. 14
	G 104	420	200	ND	9, p. B-33; 14, p. 14
Benzene	G 101	30	10	ND	9, p. B-5; 14, p. 14
	G 102	44	10	ND	9, p. B-16; 14, p. 14
	G 104	13,000 D	1000	ND	9, p. B-35; 14, p. 14
	G 113	54	10	ND	9, p. B-91; 14, p. 15
	G 116	58	10	ND	9, p. B-114; 14, p. 15
Toluene	G 104	1000	200	ND	9, p. B-33; 14, p. 14
	G 113	18	10	ND	9, p. B-91; 14, p. 15
Chlorobenzene	G 101	130,000 D	8000	ND	9, p. B-7; 14, p. 14
	G 102	260 D	20	ND	9, p. B-18; 14, p. 14
	G 104	14,000 D	1000	ND	9, p. B-35; 14, p. 14
	G 111	32	10	ND	9, p. B-76; 14, p. 15
	G 112	16	10	ND	9, p. B-82; 14, p. 15
	G 116	73	10	ND	9, p. B-114; 14, p. 15
Ethyl benzene	G 113	140	10	ND	9, p. B-91; 14, p. 15
Xylene (total)	G 113	2000 D	100	ND	9, p. B-93; 14, p. 15
2-Butanone	G 101	12	10	ND	9, p. B-5; 14, p. 14
Phenol	G 104	21,000 D	1	ND	9, p. B-40; 14, p. 14
	G 110	12	10	ND	9, p. B-72; 14, p. 15
2-Chlorophenol	G 101	920 D	10	ND	9, p. B-12; 14, p. 14
	G 104	28,000 D	1	ND	9, p. B-40; 14, p. 14
1,4-Dichlorobenzene	G 102	23	10	ND	9, p. B-20; 14, p. 14
	G 104	1200	100	ND	9, p. B-37; 14, p. 14
	G 112	12	10	ND	9, p. B-84; 14, p. 15
1,2-Dichlorobenzene	G 104	680 J (226.67)	10	19	9, p. B-37; 14, p. 14
4-Methyl phenol	G 104	450 J (45)	1	ND	9, p. B-37; 14, p. 14
Nitrobenzene	G 104	28,000 D	1	ND	9, p. B-40; 14, p. 14

Hazardous Substance	Contaminated Samples		Sample Quantitation Limit (µg/L)*	Highest Background Concentration (µg/L)**	References
	Sample ID:	Concentration (µg/L)			
	G 112	11	10	ND	9, p. B-84; 14, p. 15
2,4-Dichlorophenol	G 104	130,000 D	1	ND	9, p. B-40; 14, p. 14
	G 107	11	10	ND	9, p. B-53; 14, p. 14
Naphthalene	G 113	550 D	0.5	ND	9, p. B-98; 14, p. 15
4-Chloroaniline	G 102	1000 D	125	ND	9, p. B-23; 14, p. 14
	G 104	4500	100	ND	9, p. B-37; 14, p. 14
	G 116	1000 D	1	ND	9, p. B-119; 14, p. 15
2-Methyl naphthalene	G 113	76	10	ND	9, p. B-95; 14, p. 15
2,4,6-Trichlorophenol	G 104	50,000 D	1	ND	9, p. B-40; 14, p. 14
Diethylphthalate	G 113	12	0.05	ND	9, p. B-96; 14, p. 15
4-Nitroaniline	G 104	8500 DJ	2.5	ND	9, p. B-41; 14, p. 14
Pentachlorophenol	G 112	280 D	125	ND	9, p. B-88; 14, p. 15
Di-n-butyl phthalate	G 113	49	0.05	ND	9, p. B-96; 14, p. 15
2,4-Dimethyl phenol	G 113	38	0.05	ND	9, p. B-95; 14, p. 15
Delta-BHC	G 117	.054	0.05	ND	9, p. B-128; 14, p. 15
Aldrin	G 116	.12	0.05	ND	9, p. B-122; 14, p. 15
	G 117	.072	0.05	ND	9, p. B-128; 14, p. 15
Endosulfan I	G 107	.092	0.05	.0018 J (.018)	9, p. B-56; 14, p. 14
4,4'-DDE	G 107	.52	0.1	.015 J (.15)	9, p. B-56; 14, p. 14
4,4'-DDT	G 107	.14	0.1	ND	9, p. B-56; 14, p. 14
Aroclor-1242	G 107	12	0.005	.32 J (3.2)	9, p. B-56; 14, p. 14
Aroclor-1248	G 107	15	0.005	.2 J (2)	9, p. B-56; 14, p. 14
Aroclor-1254	G 107	19	0.005	.55 J (5.5)	9, p. B-56; 14, p. 14
Lead	G 117	238	3	50	9, p. C-20; 14, p. 15
Manganese	G 104	11,800 E	150	2480	9, p. C-8; 14, p. 14
	G 110	8460	15	2480	9, p. C-13; 14, p. 15

Notes:

D - Diluted sample
E - Estimated value, concentrations exceeded the calibration range of the instrument.
J - Estimated value
* Adjusted CRQL/CRDL for substance (Ref. 19).
** Concentrations are the highest background value and were used for comparison with the contaminated samples.
( ) - Concentrations in parentheses are the bias corrected values (Ref. 30).

Attribution

Analytical data from samples collected from sources 1-5 document the presence of hazardous substances in the plume and in the source. All the hazardous substances in the observed release by chemical analysis are present in at least one uncontained source at the site. In addition, several of these substances are present in ground water at concentrations significantly above the background concentrations. Other sources at the site are also likely to be in contact with the ground water during events which raise the ground water table.

Sources 1, 2, 3, and 4 were active landfills or sources associated with industrial waste water treatment plants which received waste from the Commercial Acid Company (now called the W. G. Krummrich Plant, a chemical manufacturing facility of Solutia Incorporated) (Refs. 12, p. 1; 14, pp. 1-3). Monsanto has produced a wide variety of chemicals, both organic and inorganic (Ref. 12, p. 1). According to a 1992 RCRA Facility Assessment Report, the following products and wastes have been or are presently generated at the facility: Spent halogenated and non-halogenated solvents, mercury contaminated wastes, chlorobenzenes, nitrochlorobenzenes and benzene compounds, phenols, phosphorus, polychlorinated biphenyl (PCB) compounds, dioxins, aromatic nitro compounds, amines and nitroamines, agent orange, maleic anhydride, acids and caustics (Ref. 12, p. 1). In addition, the landfills contain most of the same hazardous substances which have been found in the release samples in the ground water beneath the landfills. The ground water below the Sauget Area 2 site, appears to be contaminated from sources located on-site. Samples collected from the perimeter of the site do not show elevated levels of contamination like those collected from the main portion of the site (Ref. 14, p. 14).

Hazardous Substances Released

1,1,1-Trichloroethane	4,4'-DDE	Ethyl benzene
1,2-Dichlorobenzene	4,4'-DDT	Gamma-BHC
1,4-Dichlorobenzene	Aldrin	Lead
2-Butanone	Aroclor-1242	Manganese
2-Chlorophenol	Aroclor-1248	Naphthalene
2-Methyl naphthalene	Aroclor-1254	Nickel
2,4-Dichlorophenol	Benzene	Nitrobenzene
2,4-Dimethyl phenol	Chlorobenzene	Pentachlorophenol
2,4,6-Trichlorophenol	Chloroform	Phenol
4-Chloroaniline	Delta-BHC	Toluene
4-Methyl phenol	Di-n-butyl phthalate	Xylene (total)
4-Methyl-2-Pentanone	Diethylphthalate	
4-Nitroaniline	Endosulfan I	

Ground Water Observed Release Factor Value: 550

4.2.2.1.3 Likelihood of Release

Ground Water to Surface Water Likelihood of release Factor Category Value: 550

4.2.2.2 Drinking Water Threat Waste Characteristics
Not Scored

4.2.3.2 Human Food Chain Threat Waste Characteristics

4.2.3.2.1 Toxicity/Mobility/Persistence/Bioaccumulation

Hazardous Substance	Source No.	Toxicity Factor Value	Persistence Factor Value*	Mobility	Toxicity/ Persistence/ Mobility Factor Value (Table 4-16)	Bio-accumulation Value**	Ref.
1,1,1-Trichloroethane	5, OR	1	.4	1	4	5	2, p. B-19
1,2-Dichlorobenzene	4, OR	10	.4	1	4	50	2, p. B-7
1,2,4-Trichlorobenzene	3, 4	100	.4	1	40	500	2, p. B-19
1,4-Dichlorobenzene	2, OR	10	.4	1	4	50	2, p. B-7
2-Butanone	4, OR	10	.4	1	4	.5	2, p. B-13
2-Chlorophenol	4, OR	100	.4	1	40	500	2, p. B-5
2-Methyl napthalene	3, 5, OR	NA	.4	1	ND	5000	2, p. B-14
2,4-Dichlorophenol	4, OR	1000	.0007	1	.7	50	2, p. B-8
2,4-Dimethyl phenol	4, OR	100	1	1	100	500	2, p. B-8
2,4,6-Trichlorophenol	4, OR	10	1	1	10	500	2, p. B-20
4-Chloroaniline	2, 3, OR	1000	.07	1	70	5	2, p. B-5
4-Methyl-2-Pentanone	4, 5, OR	100	.4	1	40	5	2, p. B-13
4-Methyl phenol	2, 4, OR	100	.4	1	40	5	2, p. B-6
4-Nitroaniline	4, OR	1	.4	1	.4	5	2, p. B-15
4,4'-DDD	3, 4	100	1	1	100	50,000	2, p. B-6
4,4'-DDE	2, 3, 4, OR	100	1	1	100	50,000	2, p. B-6
4,4'-DDT	3, 5, OR	1000	1	1	1000	50,000	2, p. B-6
Aldrin	2, 4, OR	10,000	1	1	10,000	50,000	2, p. B-1
Alpha-BHC	4	10,000	1	1	10,000	500	2, p. B-12
Aroclor-1016	3	10,000	1	1	10,000	50,000	2, p. B-16
Aroclor-1232	3	10,000	1	1	10,000	50,000	2, p. B-16
Aroclor-1242	2, 3, OR	10,000	1	1	10,000	50,000	2, p. B-16
Aroclor-1248	2, 3, 5, OR	10,000	1	1	10,000	50,000	2, p. B-16
Aroclor-1254	2, 3, 5, OR	10,000	1	1	10,000	50,000	2, p. B-16
Aroclor-1260	3, 5	10,000	1	1	10,000	50,000	2, p. B-16
Barium	3	10,000	1	1	10,000	5	2, p. B-2
Benzene	2,3,4,5, OR	100	4	1	40	5000	2, p. B-2

Hazardous Substance	Source No.	Toxicity Factor Value	Persistence Factor Value*	Mobility	Toxicity/ Persistence/ Mobility Factor Value (Table 4-16)	Bio-accumulation Value**	Ref.
Beryllium	3	10,000	1	1	10,000	50	2, p. B-3
Cadmium	3	10,000	1	1	10,000	5000	2, p. B-4
Chlorobenzene	3, 4, OR	100	.0007	1	.07	50	2, p. B-5
Chloroform	4, 5, OR	100	.4	1	40	5	2, p. B-5
Chromium	2, 3	10,000	1	1	10,000	5	2, p. B-5
Cobalt	3	1	1	1	1	.5	2, p. B-6
Copper	2, 3	NA	1	1	ND	50,000	2, p. B-6
Delta-BHC	3, 4, OR	1	1	1	1	500	2, p. B-12
Di-n-butyl phthalate	5, OR	10	1	1	10	5000	2, p. B-7
Dieldrin	5	10,000	1	1	10,000	50,000	2, p. B-8
Endosulfan II	2, 3, 5	100	1	1	100	500	2, p. B-9
Endosulfan I	2,3,4,5, OR	100	1	1	100	500	2, p. B-9
Endosulfan sulfate	3, 5	100	1	1	100	500	2, p. B-9
Endrin	3, 5	10,000	1	1	10,000	5000	2, p. B-10
Endrin aldehyde	3, 5	NA	.4	1	ND	500	2, p. B-10
Ethyl benzene	2, 3, 4, 5, OR	10	.4	1	4	50	2, p. B-10
Gamma-BHC	3	10,000	1	1	10,000	500	2, p. B-13
Gamma-chlordane	3, 4, 5	10	1	1	10	50,000	2, p. B-4
Heptachlor epoxide	3, 4	10,000	1	1	10,000	5	2, p. B-11
Heptachlor	3, 4	1000	1	1	1000	5000	2, p. B-11
Lead	2, 3, OR	10,000	1	1	10,000	50	2, p. B-13
Manganese	1, 3, OR	10,000	1	1	10,000	.5	2, p. B-13
Naphthalene	3, 5, OR	100	.4	1	40	500	2, p. B-14
Nickel	2, 3	10,000	1	1	10,000	.5	2, p. B-14
Nitrobenzene	4, OR	1000	1	1	1000	5	2, p. B-15
Pentachlorophenol	3, 4, OR	100	1	1	100	500	2, p. B-16
Phenol	2, 3, 4, OR	1	1	1	1	5	2, p. B-16
Toluene	2, 3, 4, 5, OR	10	.4	1	4	50	2, p. B-19
Trichloroethene	5	10	.4	1	4	50	2, p. B-19
Vanadium	1, 2, 3	100	1	1	100	.5	2, p. B-20
Xylene (total)	2, 3, 4, 5, OR	1	.4	1	.4	50	2, p. B-20

Hazardous Substance	Source No.	Toxicity Factor Value	Persistence Factor Value*	Mobility	Toxicity/ Persistence/ Mobility Factor Value (Table 4-16)	Bio-accumulation Value**	Ref.
Zinc	2, 3, OR	10	1	1	10	500	2, p. B-20

Notes:

The mobility factor is 1 because of the observed release by chemical analysis.

* Persistence value for Rivers

** Bioaccumulation factor value for freshwater

The hazardous substances with the highest Toxicity/Mobility/Persistence/Bioaccumulation value are:

Aldrin
Aroclor-1016
Aroclor-1232
Aroclor-1242
Aroclor-1248
Aroclor-1254
Aroclor-1260
Dieldrin

Toxicity/Mobility/Persistence/Bioaccumulation Factor Value: 5×10^8

4.2.3.2.2 Hazardous Waste Quantity

Source No.	Source Type	Source Hazardous Waste Quantity
1 (O)	Surface Impoundment	75,343.75
2 (P)	Landfill	366.17
3 (Q)	Landfill	2883.9
4 (R)	Landfill	317.12
5 (S)	Landfill	137.86

Sum of Values: 79,048.8

Hazardous Waste Quantity Factor Value: 10,000
(Ref. 1, Table 2-6)

4.2.3.2.3 Waste Characteristics Factor Category Value

Toxicity/Mobility/Persistence Factor Value: 10,000
Hazardous Waste Quantity Factor Value: 10,000
Bioaccumulation value: 50,000

Toxicity/Mobility/Persistence Factor Value x Hazardous Waste Quantity Factor Value: 1×10^8
($10,000 \times 10,000 = 1 \times 10^8$)
(max 1×10^8)

Bioaccumulation potential factor value x
(Toxicity/Persistence Factor Value x Hazardous Waste Quantity Factor Value) : 1×10^{12}
($50,000 \times 1 \times 10^8 = 5 \times 10^{12}$)
(Max 1×10^{12})

Waste Characteristics Factor Category Value: 1,000
(Ref. 1, Table 2-7)

4.2.3.3 Human Food Chain Threat Targets

Actual Human Food Chain Contamination

Actual contamination can be established for the portion of the fishery located between the northern most boundary of the site and the southern most boundary of the site along the river (figure 1). The hazardous substances released during the 1993 flood are listed previously in section 4.1.2.1.1 of this document. PPEs for sources 3 and 4 are the entire shoreline between the most northern boundary of source 4 to the most southern boundary of source 3. The remaining sources' (1, 2, and 5) PPEs are located along the same shoreline in a straight line, directly from the respective source. Since these multiple PPEs would fall within the PPEs of sources 3 and 4, only the most northern and southern PPEs are displayed (Ref. 3, map 1).

Level I Concentrations

No level I concentrations have been identified for the Human Food Chain Threat.

Most Distant Level II Sample

Sample ID: SD-7-150
Distance from the PPE: Sample located approximately 2000 feet downstream from uppermost PPE
Reference: 23, pp. 4, 1-18, 1-19

Level II Fisheries

Identity of Fishery	Extent of Level II Fishery (Relative to PPE)	Refs.
Mississippi River	2,000 feet	3, map 1; 28

4.2.3.3.1 Food Chain Individual

Level I/Level II/or potential: Level II
Hazardous Substance: PCBs
Bioaccumulation Potential: 50,000

Identity of fishery	Type of surface water	Dilution Weight (table 4-13)	Refs.
Mississippi River	Very Large River	0.00001	27; 28; figure 1

Food Chain Individual Factor Value: 45
(Ref. 1, sec. 4.1.3.3.1)

4.2.3.3.2 Population

The Sauget Area 2 site is located along the Illinois bank of the Mississippi River at river mile 178 (Ref. 3, p. 1). Although the entire river is fished, the river adjacent to and immediately downstream of the site is mostly bank fished. Many species exist within the river, however, the most popular are Catfish, Drum and Carp (Ref. 28, p. 1). While it is known that the area is used as a fishery, the exact number of fish caught every year is unknown (Ref. 28, p. 1). Therefore, > 0 has been assigned to the Annual Production category for scoring purposes.

4.2.3.3.2.2 Level II Concentrations

Identity of fishery	Annual Production (Pounds)	Refs.	Human Food Chain Population Value (Table 4-18)
Mississippi River	> 0	28	0.03

Level II Concentrations Factor Value : 0.03

4.2.4.2 Environmental Threat Waste Characteristics

4.2.4.2.1 Ecosystem Toxicity/Mobility / Persistence/Bioaccumulation

Hazardous Substance	Source No.	Ecosystem Toxicity Factor Value	Persistence Factor Value*	Mobility	Ecosystem Toxicity/ Persistence Factor Value (Table 4-21)	Bio-accumulation Value**	Ref.
1,1,1-Trichloroethane	5, OR	10	.4	1	4	5	2, p. B-19
1,2-Dichlorobenzene	4, OR	100	.4	1	40	50	2, p. B-7
1,2,4-Trichlorobenzene	3, 4	1000	.4	1	400	500	2, p. B-19
1,4-Dichlorobenzene	2, 4, OR	100	.4	1	40	50	2, p. B-7
2-Butanone	4, OR	1	.4	1	.4	.5	2, p. B-13
2-Chlorophenol	4, OR	100	.4	1	40	500	2, p. B-5
2-Methyl naphthalene	3, 5, OR	1000	.4	1	400	5000	2, p. B-14
2,4-Dichlorophenol	4, OR	100	.0007	1	.07	500	2, p. B-8
2,4-Dimethyl phenol	4, OR	100	1	1	100	500	2, p. B-8
2,4,6-Trichlorophenol	4, OR	1000	1	1	1000	50,000	2, p. B-20
4-Chloroaniline	2, 3, 4, OR	10,000	.07	1	700	5	2, p. B-5
4-Methyl-2-Pentanone	4, 5, OR	1	.4	1	.4	5	2, p. B-13
4-Methyl phenol	2, 4, OR	NA	.4	1	ND	5	2, p. B-6
4-Nitroaniline	4, OR	1	.4	1	.4	5	2, p. B-15
4,4'-DDD	3, 4	10,000	1	1	10,000	50,000	2, p. B-6
4,4'-DDE	2, 3, 4, OR	10,000	1	1	10,000	50,000	2, p. B-6
4,4'-DDT	3, 5, OR	10,000	1	1	10,000	50,000	2, p. B-6
Aldrin	2, 4, OR	10,000	1	1	10,000	50,000	2, p. B-1
Alpha-BHC	4	100	1	1	100	500	2, p. B-12
Aroclor-1016	3	10,000	1	1	10,000	50,000	2, p. B-16
Aroclor-1232	3	10,000	1	1	10,000	50,000	2, p. B-16
Aroclor-1242	2, 3, OR	10,000	1	1	10,000	50,000	2, p. B-16
Aroclor-1248	2, 3, 5, OR	10,000	1	1	10,000	50,000	2, p. B-16
Aroclor-1254	2, 3, 5, OR	10,000	1	1	10,000	50,000	2, p. B-16
Aroclor-1260	3, 5	10,000	1	1	10,000	50,000	2, p. B-16
Barium	3	1	1	1	1	.5	2, p. B-2
Benzene	2, 3, 4, 5, OR	100	.4	1	40	500	2, p. B-2
Beryllium	3	NA	1	1	ND	50	2, p. B-3
Beta-BHC	5	NA	1	1	ND	500	2, p. B-12

Hazardous Substance	Source No.	Ecosystem Toxicity Factor Value	Persistence Factor Value*	Mobility	Ecosystem Toxicity/ Persistence Factor Value (Table 4-21)	Bio-accumulation Value**	Ref.
Cadmium	3	1000	1	1	1000	5000	2, p. B-4
Chlorobenzene	3, 4, OR	1000	.0007	1	.7	50	2, p. B-5
Chloroform	4, 5, OR	10	.4	1	4	5	2, p. B-5
Chromium	2, 3	100	1	1	100	5	2, p. B-5
Cobalt	3	NA	1	1	ND	5000	2, p. B-6
Copper	2, 3	100	1	1	100	50,000	2, p. B-6
Delta-BHC	3, 4, OR	NA	1	1	ND	500	2, p. B-12
Di-n-butyl phthalate	5, OR	1000	1	1	1000	5000	2, p. B-7
Dieldrin	5	10,000	1	1	10,000	50,000	2, p. B-8
Endosulfan II	2, 3, 5	10,000	1	1	10,000	50,000	2, p. B-10
Endosulfan I	2, 3, 4, 5, OR	10,000	1	1	10,000	50,000	2, p. B-10
Endosulfan sulfate	3, 5	NA	1	1	ND	500	2, p. B-9
Endrin	3, 5	10,000	1	1	10,000	50,000	2, p. B-10
Endrin aldehyde	3, 5	NA	.4	1	ND	500	2, p. B-10
Ethyl benzene	2, 3, 4, 5, OR	100	.4	1	40	50	2, p. B-10
Gamma-BHC	3	10,000	1	1	10,000	500	2, p. B-13
Gamma-chlordane	3, 4, 5	10,000	1	1	10,000	500	2, p. B-4
Heptachlor epoxide	3, 4	10,000	1	1	10,000	50,000	2, p. B-11
Heptachlor	3	10,000	1	1	10,000	50,000	2, p. B-11
Lead	2, 3, OR	1000	1	1	1000	5000	2, p. B-13
Manganese	1, 3, OR	NA	1	1	ND	50,000	2, p. B-13
Naphthalene	3, 5, OR	1000	.4	1	400	500	2, p. B-14
Nickel	2, 3	10	1	1	10	500	2, p. B-14
Nitrobenzene	4, OR	100	1	1	100	5	2, p. B-15
Pentachlorophenol	3, 4, OR	100	1	1	100	5000	2, p. B-16
Phenol	2, 3, 4, OR	10,000	1	1	10,000	5	2, p. B-16
Toluene	2, 3, 4, 5, OR	100	.4	1	40	50	2, p. B-19
Trichloroethene	5	100	.4	1	40	50	2, p. B-19
Vanadium	1, 2, 3	NA	1	1	ND	.5	2, p. B-20
Xylene (total)	2, 3, 4, 5, OR	100	.4	1	40	50	2, p. B-20
Zinc	2, 3, OR	10	1	1	10	500	2, p. B-20

Notes:

* Persistence value for Rivers
** Environmental Bioaccumulation factor value for freshwater

The substances which document the highest Ecosystem Toxicity/Mobility/Persistence/Bioaccumulation value include:

4,4'-DDD	Aroclor-1242	Endosulfan II
4,4'-DDE	Aroclor-1248	Endosulfan I
4,4'-DDT	Aroclor-1254	Endrin
Aldrin	Aroclor-1260	Heptachlor epoxide
Aroclor-1016	Dieldrin	Heptachlor
Aroclor-1232		

Ecosystem Toxicity/Mobility/Persistence/Bioaccumulation Factor Value: 5×10^8
(Ref. 1, Table 4-30)

4.2.4.2.2 Hazardous Waste Quantity

Source No.	Source Type	Source Hazardous Waste Quantity
1 (O)	Surface Impoundment	75,343.75
2 (P)	Landfill	366.17
3 (Q)	Landfill	2883.9
4 (R)	Landfill	317.12
5 (S)	Landfill	137.86

Sum of Values: 79,048.8

Hazardous Waste Quantity Factor Value: 10,000
(Ref. 1, Table 2-6)

4.2.4.2.3 Waste Characteristics Factor Category Value

Ecosystem Toxicity/Persistence/ Mobility Factor Value: 10,000
Hazardous Waste Quantity Factor Value: 10,000
Bioaccumulation value: 50,000

Ecosystem Toxicity/Persistence Factor Value x Hazardous Waste Quantity Factor Value: 1×10^8
(10,000 x 10,000 =1x 10^8)
(max 1×10^8)

Ecosystem Bioaccumulation potential factor value x
(Ecosystem Toxicity/Persistence Factor Value x Hazardous Waste Quantity Factor Value) : 1×10^{12}
(50,000 x 1 x 10^8 =5 x 10^{12})
(Max 1 x 10^{12})

Waste Characteristics Factor Category Value: 1,000
(Ref. 1, Table 2-7)

4.2.4.3 Environmental Threat Targets

Environmental targets include sensitive habitats for six threatened or endangered species of birds and wetlands located within source 4. These species were identified by the Illinois Department of Natural Resources as nesting or foraging within the Sauget Area 2 site (Ref. 15, p. 2). The Palustrine wetlands were identified by the Illinois Department of Conservation (Ref. 20, p. 14). The wetlands in Source 3 contain vegetation consistent with that found in wetlands of this type, such as the Eastern Cottonwood, Black Willow, Water Plantain and Potamogeton nodosus (Ref. 20, p. 5, 14, 15, 20).

Most Distant Level II Sample
Sample ID: SD-7-150
Distance from the PPE: Sample located approximately 2000 feet downstream from uppermost PPE
Reference: 23, pp. 4, 1-18, 1-19

4.2.4.3.1 Sensitive Environments

4.2.4.3.1.1 Level I Contamination

No level I concentrations have been identified for the Environmental Threat.

4.2.4.3.1.2 Level II Concentrations

Sensitive environments

Type of Surface Water Body	Sensitive Environment	References	Sensitive Environment Value (Table 4-23)
Very Large River	Bald Eagle Habitat	15, p. 2; 29, p. 1	75 - Federal threatened
Very Large River	Common Moorhen Habitat	15, p. 2; 29, p. 5	50 - State threatened
Very Large River	Black-crowned Night Heron Habitat	15, p. 2; 29, p. 6	50 - State endangered
Very Large River	Snowy Egret Habitat	15, p. 2; 29, p. 6	50 - State endangered
Very Large River	Little Blue Heron Habitat	15, p. 2; 29, p. 6	50 - State endangered
Very Large River	Yellow-crowned Night Heron Habitat	15, p. 2; 29, p. 6	50 - State endangered

Sum of Level II Sensitive Environments Value: 325

Wetlands

While the wetland presently has been impacted by removal actions and a dry period, this area, under normal conditions, contains vegetation and soil types consistent with those of a wetland (Ref. 20, p. 14).

Type of Surface Water Body	Wetland Frontage (miles)	References	Wetlands Value (Table 4-24)
Wetland adjacent to Large River	3.2 mi*	Figure 1; 20, p. 14	100

* This number was determined by measuring the perimeter of the wetland located in Source 3 (Figure 1). Most of the Source contains soils that have been classified as those found in wetlands (Ref. 1, Section 4.1.4.3.1.2; 20, p. 14, 15).

Sum of Sensitive environments and wetlands value: 425

Exhibit 2

Sauget Sites - Area 2- St. Clair County
Site O - L1631210020
ILD000672329
Site P - L1631210002
ILD984809293
Site Q - L1631210001
ILD000605790
Site R - L1631210003
ILD980606982

Superfund/HRS

CERCLA
Expanded Site Inspection Report

Illinois Environmental Protection Agency

2200 Churchill Road
P. O. Box 19276
Springfield, IL 62794-9276

SECTION 1

INTRODUCTION

The Illinois Environmental Protection Agency's (IEPA or Agency) Pre-Remedial program was tasked by Region V of the United States Environmental Protection Agency (USEPA) on September 21, 1993 to conduct an Expanded Site Inspection (ESI) of the Sauget Area 2 sites located in Sauget, St. Clair County, Illinois.

The sites have been added to the Comprehensive Environmental Response, Compensation and Liability Act Information System (CERCLIS) over a period of time. These actions were taken as a result of the concern over the threat to human health and the environment that the sites are believed to pose. The sites have been evaluated in the form of CERCLA Preliminary Assessments performed by the IEPA; an Expanded Site Investigation performed by Ecology and Environment in 1986, and a Screening Site Inspection performed by the IEPA's Pre-Remedial Unit in the summer of 1991, along with several other separate sampling events.

The purpose of the ESI has been stated by USEPA in a directive outlining Pre-Remedial program strategies. The directive states:

> The objective of the Expanded Site Inspection (ESI) is to provide documentation for preparing the Hazard Ranking System (HRS) package to support National Priority List (NPL) rulemaking. Remaining HRS information requirements are addressed and site hypothesis not completely supported during previous investigations are evaluated. Expanded SI sampling is designed to satisfy HRS data requirements by documenting observed releases, observed contamination, and levels of

actual contamination at targets. In addition, these investigations collect remaining non-sampling information. Sampling during the ESI includes background and quality assurance/quality control samples to fully document releases and fully document them to the site. Following the ESI, information collected and analytical results will be assembled into a report. USEPA site assessment managers review the ESI report and assign the site a priority for HRS package preparation and proposal to the NPL.

The Region V offices of the U.S. EPA have also requested that the Illinois Environmental Protection Agency identify sites during the ESI that may require removal actions to remediate an immediate human health and/or environmental threat.

It is this author's findings that one of the sites, Site Q, does pose an immediate threat to the human food chain and environmental resources of the Mississippi River that would warrant such a response action. This situation will be addressed later in this report.

SECTION 2

SITE BACKGROUND

2.1 INTRODUCTION

This section includes descriptive, historical, and regulatory information obtained over the course of the formal CERCLA Expanded Site Inspection (ESI) investigation and previous IEPA activities involving the Sauget Area 2 sites. Section 1.1 of the revised Hazard Ranking System (HRS) defines "site" as: "Area(s) where a hazardous substance has been deposited, stored, disposed, or placed, or has otherwise come to be located." This may include sources and the area(s) between sources. Additional information about sources included in the Sauget Area 2 is presented in Section Four of this report.

2.2 SITE DESCRIPTION

2.2.1 Introduction

The Sauget Area 2 Sites are comprised of five separate sources of contamination: four landfills: Site Q, Site R, Site P, and "Site S" (as yet to be added to CERCLIS) and the four former settling lagoons which comprise Site O. "Site S" was discovered on an aerial photo dated March 3, 1975, and had been previously unknown. Four sites are situated within the corporate boundary of the village of Sauget and one site is situated within the boundaries of both Sauget and Cahokia in St. Clair County, Illinois.

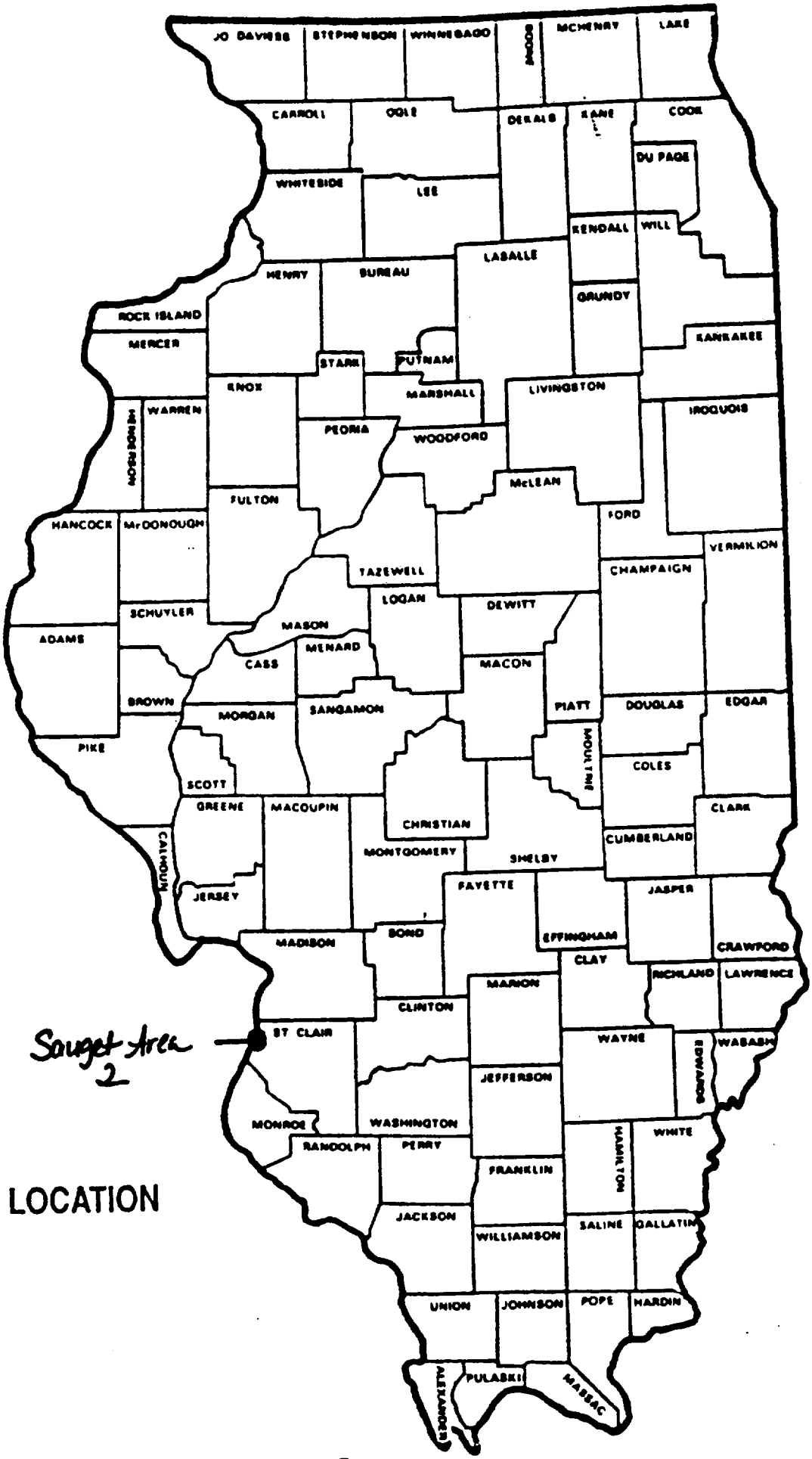
Aggregated Sources at Sauget Sites Area 2

Site Name	Source Type	Source Size	Years of Operation	Owner at time of operation
O	Lagoons	*20	1966-1980	Village of Sauget
Q	Landfill	*90	1962-1975	Cahokia Trust
P	Landfill	*35	1972-1984	Union Electric Paul Sauget
R	Landfill	*36	1957-1977	Monsanto Chemical Company
S	Landfill	*6	1974 ?	Village of Sauget

*in acres

2.2.2 Site O

Site O of Area 2 consists of four covered sludge dewatering lagoons associated with the old village of Sauget Wastewater Treatment Plant (WWTP). The site covers approximately 20 acres on Mobile Avenue within the corporate limits of the village of Sauget. The site is bordered on the north by the village of Sauget Physical/Chemical Plant, to the northwest by Clayton Chemical, to the east by tracks of the Terminal Railroad and farmland, to the west by Trade Waste Incineration, and to the south by the American Bottoms Regional Treatment Plant (ABRTP), operated by the village of Sauget. The access road for the ABRTP bisects the lagoons. The village of Sauget retains ownership of the lagoons. The lagoons appear to have been excavated into the Henry Formation sands.



Sauget Area 2

SITE LOCATION

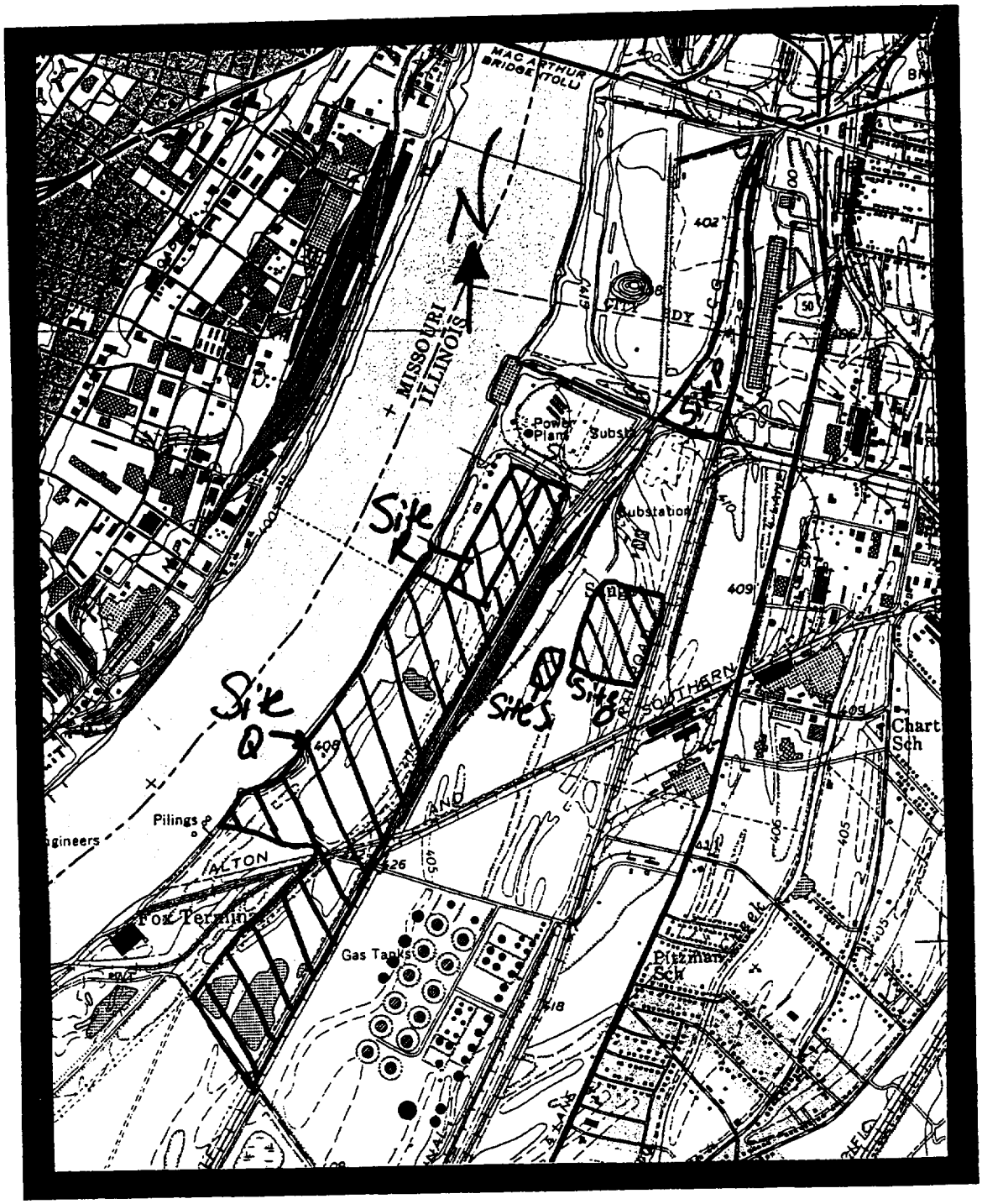
Source: IEPA, 1994. Base Map: Illinois Department of Transportation, 1985.

FIGURE 2-2

REGIONAL AREA MAP

Scale 1:10560

CERCLA Expanded Site Inspection - Sauget Area 2



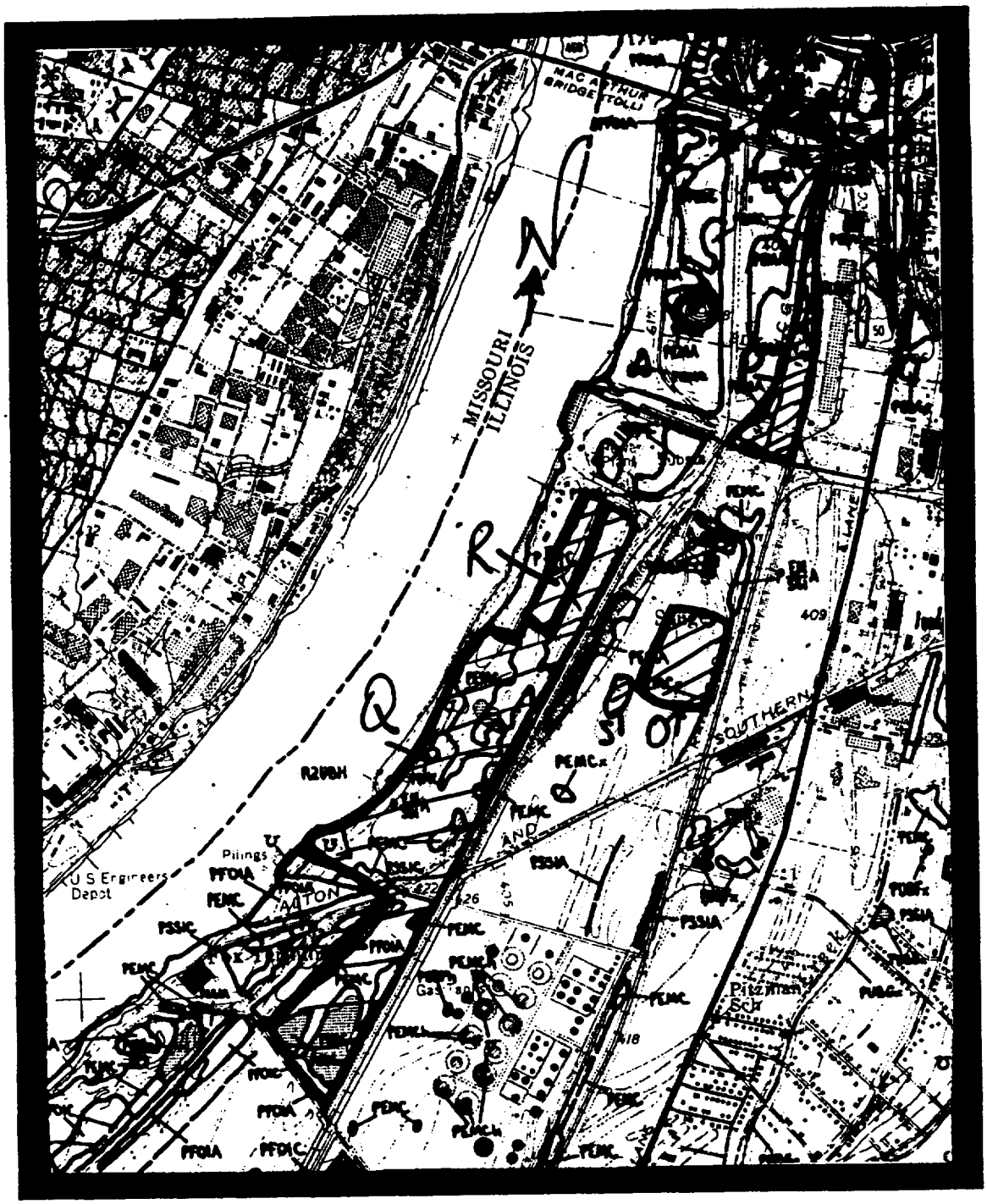
Source: IEPA, 1994. Base Map: USGS, Cahokia Quadrangle, 1974.

FIGURE 2-3

SITE TOPOGRAPHY

Scale : 1 : 2000

CERCLA Expanded Site Inspection - Sauget Area 2



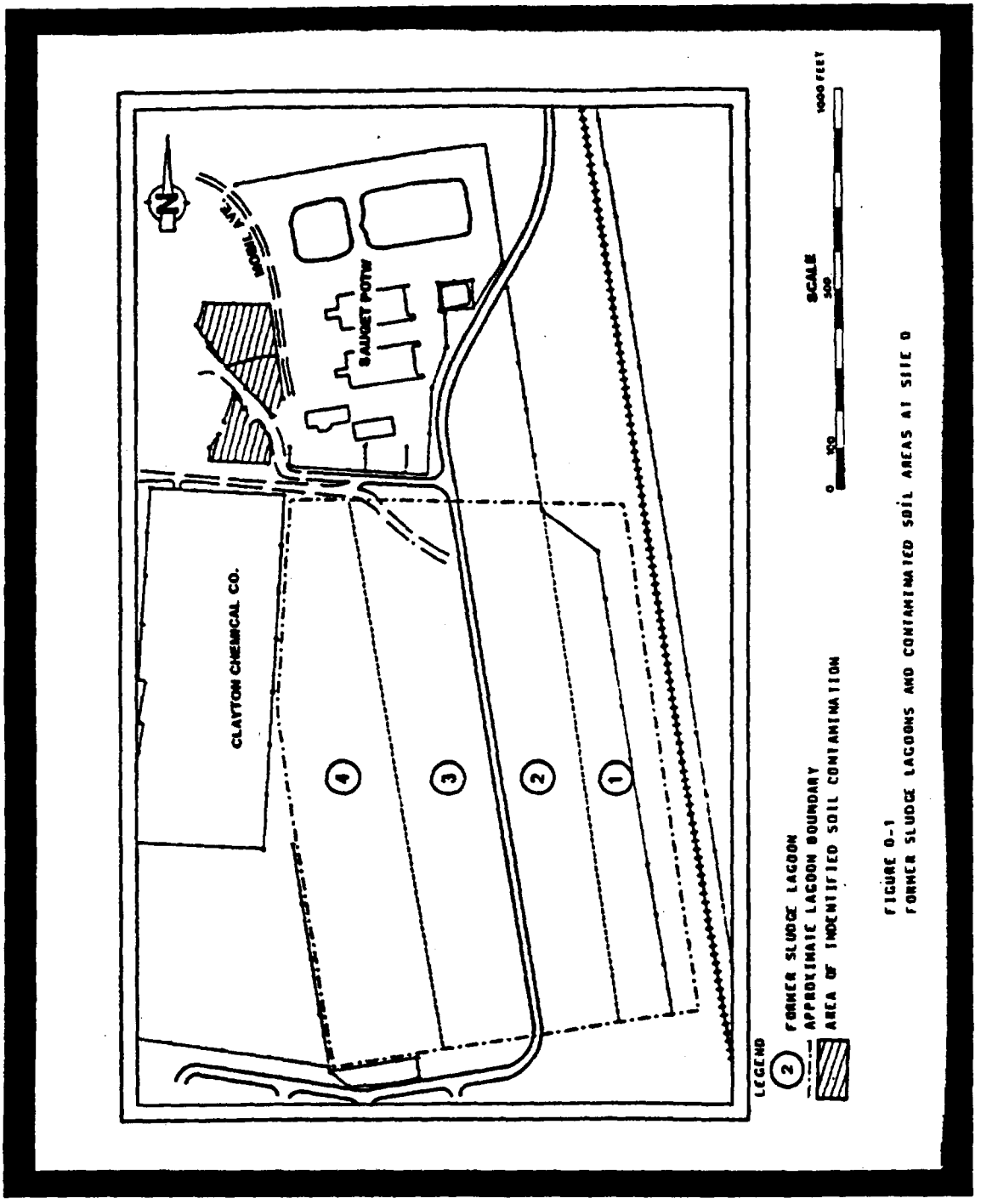
Source: IEPA, 1994. Base Map: U.S. Department of the Interior, 1988.

FIGURE 2-4

WETLANDS INVENTORY MAP

Scale 1:2000

CERCLA Expanded Site Inspection - Sauget Area 2



Source: IEPA, 1994. Base Map: Ecology and Environment, 1986.

FIGURE 2-5

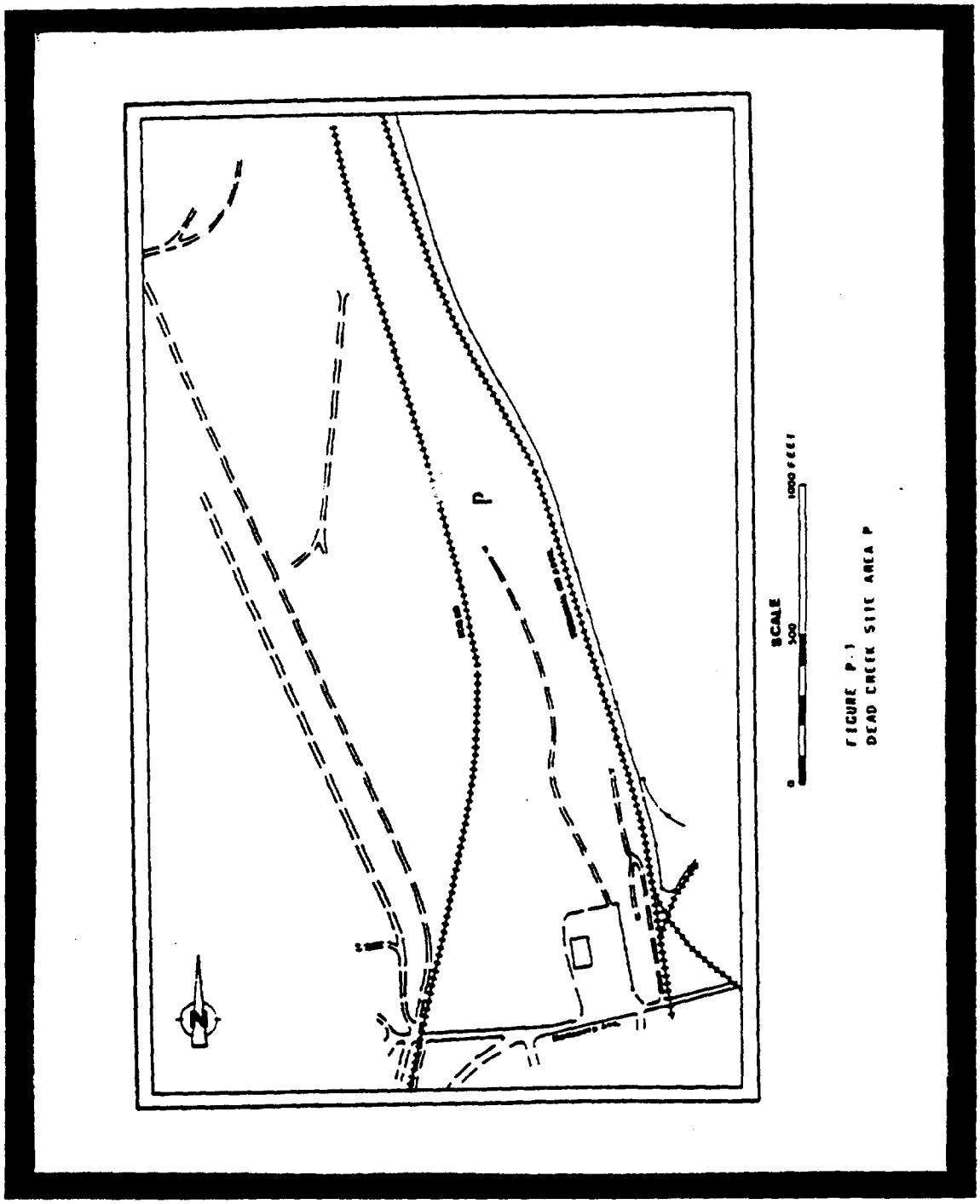
SITE O - FEATURES

According to the Expanded Site Investigation Report prepared for the IEPA by Ecology and Environment in 1986, the depth of waste in the lagoons is approximately seven feet below the surface. However, the IEPA Expanded Site Inspection sampling team found contamination at a depth of approximately one and one-half to two feet. The lagoons are separated into four sections. Each section is separated a berm approximately five feet wide. The lagoons were covered with fill in 1978. IEPA was told that a clay cap had been placed upon the lagoons, however, the ESI sampling team did not find any evidence of an engineered clay cap at the site.

2.2.3 Site P

The site, also known as P.T.s Showclub/Sauget-Monsanto Landfill, is located along Monsanto Avenue in Sauget. The triangularly-shaped site is approximately 20 acres in size (Refer to Figure 2-6). Site P is located on the eastern side of the U.S. Army Corps of Engineers flood control levee (500-year). The site is bordered on the west by the Illinois Central Gulf Railroad; on the south by Monsanto Avenue; on the east by a spur of the Terminal Railroad Association Railroad. The two railroads converge to delineate the northern boundary of the site. Generally, the geology consists of silty sand, underlain by silty clay, followed by fine to coarse-grained sands down to the bedrock.

The site is covered with black cinders and slag material. Surface drainage is towards the south-central portion of the site, which



Source: IEPA, 1994. Base Map: Ecology and Environment, 1986.

FIGURE 2-6

SITE P - FEATURES

was not landfilled due to the presence of a potable water line in this area. A low-lying area is also located along the east perimeter, adjacent to the Terminal Railroad. Generally, surface drainage would not leave the site due to the presence of railroad embankments along the perimeter and the depression in the central portion of the site.

According to the National Wetland Inventory maps provided by the Illinois Department of Conservation, the low-lying area along the western boundary of the site has been designated a Palustrine Emergent wetland. It is an isolated wetland, receiving run-off from the elevated portion of the site as well as being influenced by the stage of the Mississippi River. When the river is at an elevated stage, the wetland becomes inundated with groundwater.

2.2.4 Site Q

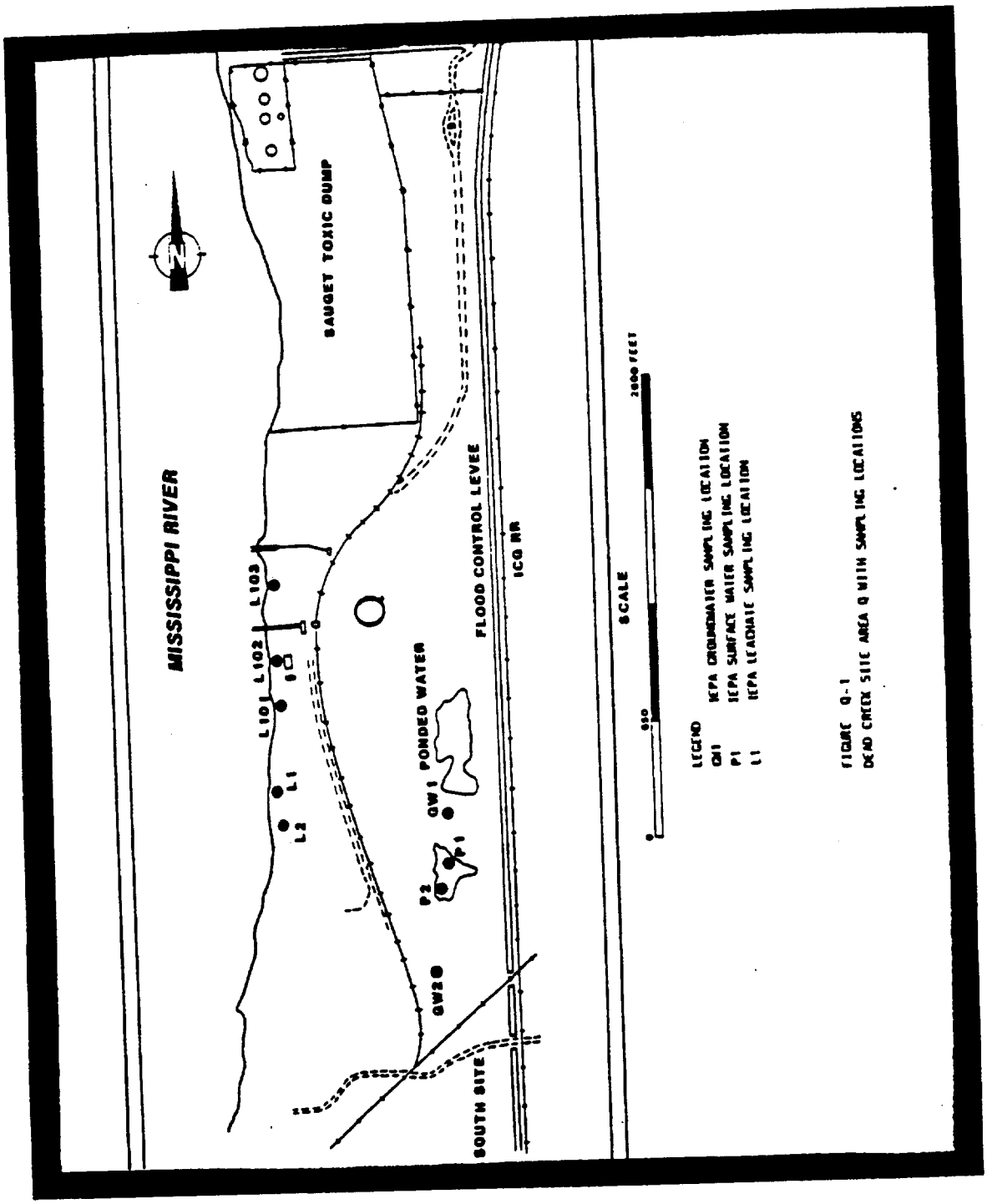
The site, also known as the Sauget and Company Landfill is an active site occupying a parcel of land approximately 90 acres in size located within the corporate limits of the villages of Sauget and Cahokia. The site is currently owned by Eagle-Marine Industries of St. Louis. The landfill was operated by Paul Sauget and Sauget and Company and then Browning-Ferris Industries between the years 1962 and 1975. The rectangularly-shaped landfill also includes a portion known as the southern extension, laying south of the intersection of the Alton and Southern Railroad and Illinois

Central Gulf Railroad tracks. It also includes a northern "dog-leg" portion, situated directly west of Site R.

Vehicular access to the site is controlled by Riverside and Pitzman Avenues along the north and access from the dirt road near the center of the site is currently blocked by concrete blocks placed at the site by Bauer Construction. The concrete was placed at the access point to keep unknown parties from disposing of waste at the site.

Much of the property is leased out to other private businesses. According to Mr. Richard Burke, representative of Eagle Marine, Peavey Grain operates a grain unloading and transfer facility at the rectangular portion of the site. River City Landscaping also operates on a parcel of land south of the Peavey operation. Another portion of the rectangular portion of the property is leased to Bauer Construction who separates metal bars from reinforced concrete.

Several features are apparent on the site and are described in the following paragraph. A borrow pit, approximately two acres in size, is located along the east-central portion of the property. Deteriorating drums were noted emerging from mounded areas within this borrow pit during the March 1994 ESI. Seeps have been noted in the past at various areas of the site. A four-inch diameter pipe, approximately 25 feet in length was located along the western edge



Source: IEPA, 1994. Base Map: Ecology and Environment, 1986.

FIGURE 2-7

SITE Q - FEATURES

of the site. This pipe appeared to allow the direct disposal of liquid wastes into the Mississippi River. Samples taken from near the pipe in 1991 supports this belief. The pipe no longer exists. In the southern extension of the site, wetland areas are located in two borrow pits (according to the National Wetland Inventory maps). The borrow pits were created during the construction of the United States Army Corps of Engineers' levee system. One pit (approximately eleven acres) contains the remnants of drums and solidified wastes. The other borrow pit (approximately five acres) contains similar drums and solidified waste as the easternmost pit. The level of water in these pits is influenced by the level of the Mississippi River. When the river level is high, these pits are inundated with water. When the level of the river falls, the pits are devoid of water. During the flood of 1993, the entire expanse of Site Q was inundated by floodwaters, thus creating a direct release of contaminants into the river.

2.2.5 Site R

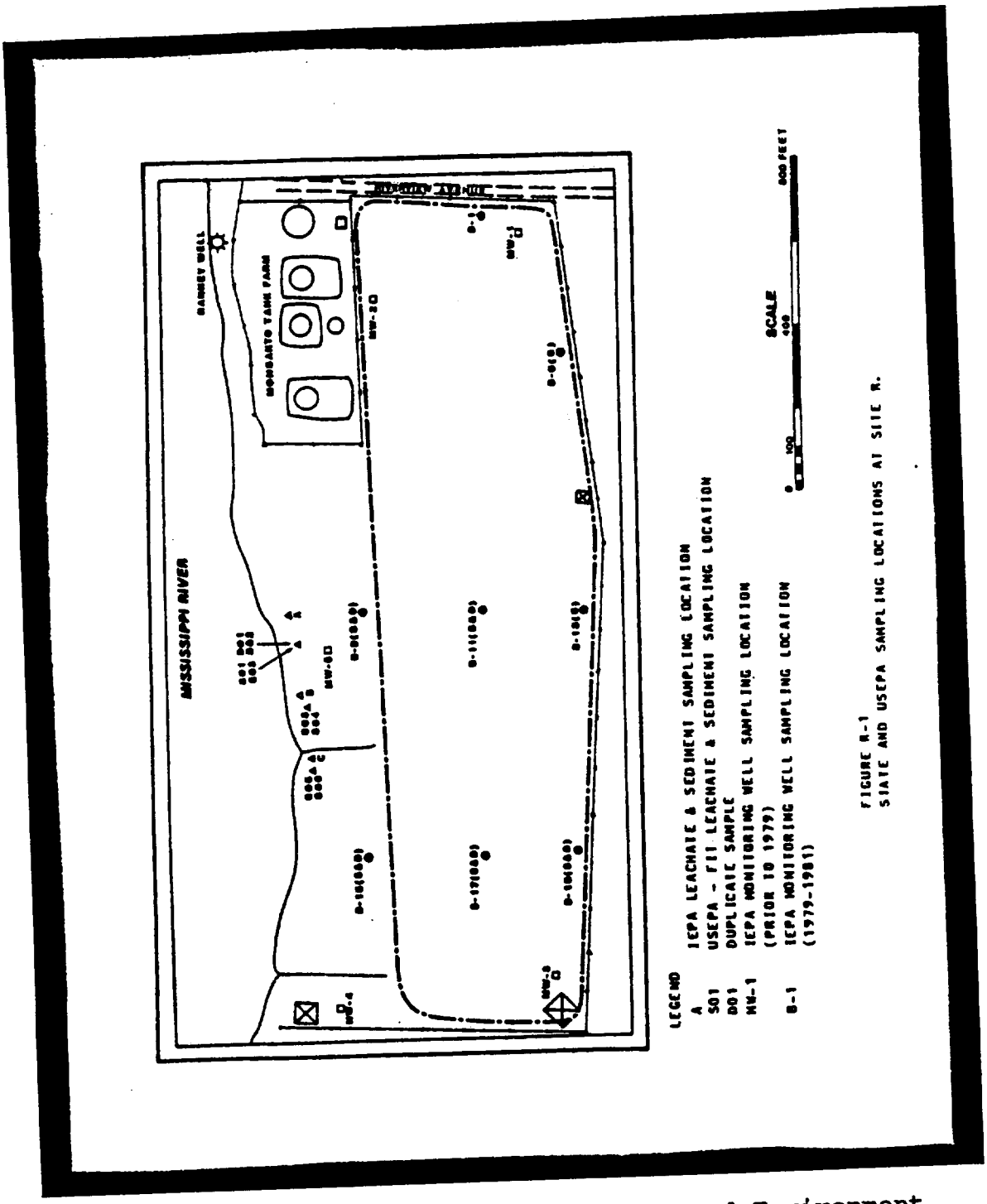
The site, also known as the Sauget Toxic/River's Edge Landfill is approximately 40 acres in size. It is located west of the U.S. Army Corps of Engineers flood control levee and is situated along the Mississippi River (Refer to Figure 2-8). The rectangularly-shaped landfill is bordered along the north by Union Electric's abandoned power plant (currently owned by Cahokia Marine Company), to the west by a 200 foot strip of property owned by Monsanto, separating

the landfill from the Mississippi River, to the south and east by Site Q, Trade Waste Incinerator and Clayton Chemical, and to the southeast by the American Bottoms Regional Treatment Plant.

The site is clay-capped and vegetated. The thickness of the cap varies from two to eight feet, according to boring logs. Drainage is directed to ditches around the perimeter of the site. The perimeter drainage trench located along the western boundary of the site is intersected by two additional trenches which divert stormwater to the Mississippi River. Concrete rip-rap extends from the riverbank along the western boundary of the site and extends from the site thirty feet into the Mississippi River. The site is surrounded by an eight-foot cyclone fence, which is under surveillance by the Monsanto Company, which also controls access to the site.

2.2.6 Site S

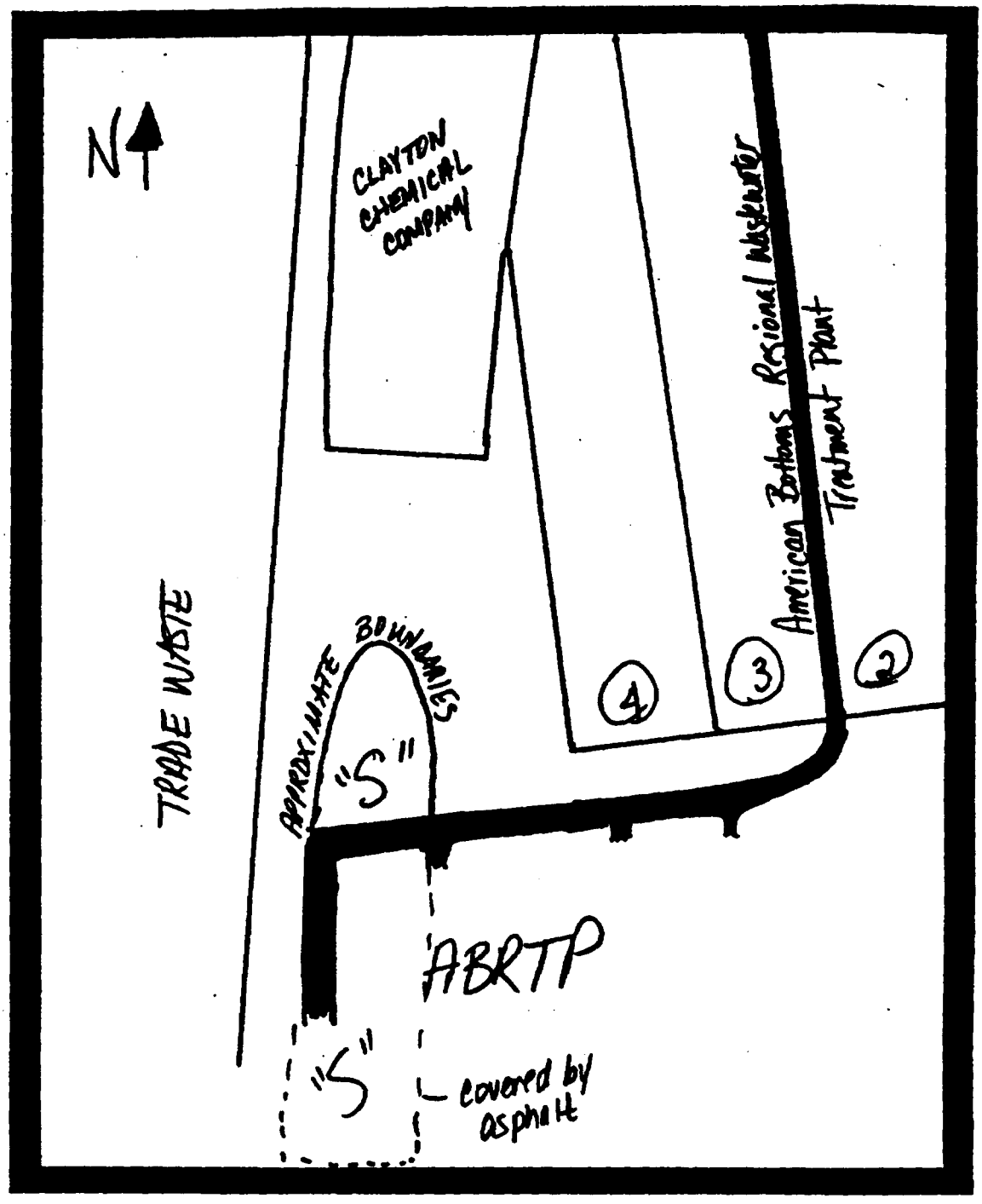
The site is situated approximately 100 feet west of Site O, within the corporate boundaries of the village of Sauget. Site S is approximately five acres in size and is located on property owned by the village of Sauget. The site is partially covered by the American Bottoms Regional Treatment Plant's asphalted parking area. Site S is bordered to the north by village property and Clayton Chemical, to the east by Site O, and to the west by the Trade Waste Incinerator, and the south by the ABRTP. The site is separated from Clayton Chemical and Trade Waste by fencing.



Source: IEPA, 1994. Base Map: Ecology and Environment, 1986.

FIGURE 2-8

SITE R - FEATURES



Source: IEPA, 1994. Base Map: Ecology and Environment, 1986.

FIGURE 2-9

SITE S - FEATURES

Scale: 1:300

CERCLA Expanded Site Inspection - Sauget Area 2

An aerial photograph from March 3, 1974 shows the site as a drum disposal area of unknown depth. In the photo, drums and standing liquid can be seen in the excavation. A dirt road leading from Clayton Chemical to the drum disposal area can also be seen on the aerial photo. Currently, no other official information is available concerning the site.

2.3 SITE HISTORIES

2.3.1 Introduction

This portion of the ESI provides relatively brief, general, and regulatory histories of the activities which have taken place at the Sauget Area 2 Sites.

2.3.2 Site O

The Sauget Treatment Plant has been in operation in some form since approximately 1966. The plant primarily treated effluent from area industries, but also provided treatment for the entire village of Sauget. Approximately ten million gallons per day (gpd) of waste water was treated at this facility, of which over 95 percent of the influent came from industrial sources. Area industries served by the village of Sauget Wastewater Treatment Plant include: Monsanto Chemical, Cerro Copper, Sterling Steel Foundry, Amax Zinc, Rogers Cartage, Edwin Cooper, and Midwest Rubber. Effluent from the treatment plant was directed to a National Pollutant Discharge Elimination System (NPDES) permitted discharge point in the

Mississippi River.

The treatment plant had a long history of NPDES permit violations, for the most part due to the chemical quality of the plant effluent. Mercury, PCBs, and organic solvents had been detected at concentrations exceeding the permit limits on several occasions. A USEPA study conducted in 1982 concluded that the treatment plant wastewater contributed a substantial volume of priority, toxic pollutants annually to the Mississippi River. Since operations began, the plant has undergone several modifications and upgrades, increasing both capacity and effluent quality. Currently, the plant is used for pretreating industrial waste before it enters the American Bottoms plant.

According to a Notification of Hazardous Waste Site Form submitted to USEPA in 1981, the former lagoons were used for disposal of clarifier sludges from 1965 to approximately 1978. The lagoons were not artificially lined, and were apparently excavated into the Henry Formation Sand. Initially, the sludge was not treated in any way after being placed in the lagoons. After an unknown period of time, lime was used for neutralization.

In 1982, IEPA personnel collected a sample of filter cake sludge from the treatment plant, which would provide an indication of the chemical quality of sludges placed in the lagoons over the years. Analysis of this sample showed several organic contaminants,

including chlorinated benzenes, xylene, and aliphatic hydrocarbons, at concentrations ranging from 120 to 820 ppm. The lagoons are presently covered with approximately two fill of clay and have a vegetative cover.

Extensive construction/excavation has been done since 1981 in the area surrounding the former Sauget Treatment Plant. The new American Bottoms Regional Treatment Plant, completed in 1985, is located immediately south of the former sludge lagoons. Several problems involving chemical wastes were encountered during excavation work for the construction of this facility. In 1984, workers uncovered a black, tar-like substance with a strong solvent odor while digging a trench for sewer and water lines to the new treatment plant. Although file information is incomplete concerning the exact location of this incident, it is thought to be in the southern portion of lagoons three and four. Two samples of the waste material were collected by Envirodyne Engineers, Inc. (EEI) of St. Louis, and a limited organic analysis was run. Both samples showed the presence of PCBs (477 to 653 ppm), phenol (0.28 to 12.0 ppm), and oil and grease (29 to 35 percent). Benzene was also detected at trace levels (1 ppb) in both samples.

Several additional locations have reportedly been sampled by EEI as a result of uncovering waste materials during excavation activities around the Sauget Treatment Plant. However, attempts to gather information concerning specific sample locations and analytical

data have been of limited success. Chemical data for two soil samples collected from excavated soil piles in the area of the former sludge lagoons was acquired. These results are shown in Appendix F. Both samples show high levels of several chlorinated organics and other priority pollutants. Values were listed for total PCBs, however, the PCB results could not be verified by the laboratory. Although limited data had been acquired, it appears that the former sludge lagoon area likely contains widespread organic and inorganic contamination.

2.3.3 Site P

Sauget and Company entered into a lease agreement with the Union Electric Company in St. Louis to operate a waste disposal facility in 1972. In January 1973, IEPA issued an operating permit to Sauget and Company to accept only non-chemical waste from Monsanto. In 1974, Sauget and Company subsequently applied for, and was granted, a supplemental permit which allowed acceptance of general waste and diatomaceous earth filter cake from Edwin Cooper,Inc. (now Ethyl Corporation). Also at this time, the IEPA began conducting routine inspections of the facility, at which time no violations were evident. In October 1975, an inspector observed a small amount of yellowish, tar-like liquid in an area adjacent to several crushed fiber drums which were labelled "Monsanto ACL-85, Chlorine Composition." Sauget and Company and Monsanto were subsequently notified of this permit violation, and the matter was not further addressed. The site was operated in general compliance until

December 1977, when an inspection revealed the disposal of approximately 25 metal containers (12-15 gallon) full of phosphorus pentasulfide (P2S5), a flammable solid. Monsanto was required to excavate and remove all of this material from the site, and to discontinue disposal of any chemical wastes or packaging.

According to file information, the IEPA became aware of another potential problem at this time, specifically the use of a Southern Railway slag pile for intermediate and final cover material. Analysis of this slag showed it to be unsuitable for cover due to its high permeability and high heavy metal content. Cinders were also used as cover material at Site P, and are expected to pose the same problems as the slag; that is, increased surface water infiltration and the resulting potential for leaching heavy metals along with organic wastes into the groundwater.

State inspections in 1978 and 1979 indicated unpermitted disposal of Monsanto ACL filter residues and packaging. The composition of this material is not known. According to the site operator at that time, this material would occasionally ignite when in contact with the filter cake waste from Edwin Cooper.

The southern one-third of Site P was purchased from Illinois Central Gulf in 1971 by Paul Sauget. An Illinois-American Water Company distribution main was discovered in 1980 during preparatory excavation on the southern portion of the site. Following the

discovery of the water line, site plans and permits were modified to include no waste disposal within 100 feet of the line.

Review of available IEPA records indicate that the Edwin Cooper filter cake is the only industrial process that was reported to have been disposed of at Site P. Records indicate that approximately 117,000 cubic yards of this material was accepted. The filter cake was classified as non-hazardous on IEPA special waste authorization permit number #7400017, based on EP toxicity results submitted in 1973. Additional analytical data is available for a filter cake composite sample from Edwin Cooper in 1979 which indicates elevated levels of lead (18.4 ppm), cadmium (1.8 ppm), zinc (7220 ppm), and a pH of 11.22. No groundwater monitoring program has been established for Site P, nor have wastes at the site been adequately characterized. No sampling or other field investigation activities have been conducted, other than routine IEPA inspections, at the site.

During a June, 1991 CERCLA Screening Site Inspection, IEPA noted elevated levels of volatile organic compounds around the perimeter of the landfill. This was noted with the use of an 11.7 eV photoionization detector.

A nightclub, P.T.s Showclub, was built on top of the landfill along the west-central portion of the site in the early 1980's. The nightclub is owned by a private trust group.

2.3.4 Site Q

According to the Sauget Expanded Site Investigation prepared by Ecology and Environment for the IEPA in 1988, disposal operations began at Site Q in approximately 1962. Union Electric Company operated a flyash pond the site in an area immediately south of Monsanto's chemical dump (Site R). IEPA inspections in the early 1970's documented several violations of the Illinois Environmental Protection Act, including open burning, use of unsuitable cover materials (cinders and flyash), and acceptance of liquid chemical wastes. Septic tank pumpings were also accepted at the site from approximately 1968 to 1972, and were apparently co-disposed of with general municipal refuse.

In April 1971, a complaint was filed by IEPA against Sauget and Company (the landfill operator) for the violations listed above. The company was ordered to cease and desist open burning, accepting liquid chemical wastes, open dumping, and using cinders and flyash as cover material. In July 1972, a smoldering underground fire was observed by IEPA inspectors at the site. The fire continued to smolder until October 1972 despite repeated attempts to extinguish it. Underground fires were a continuing problem, as documented by later IEPA inspection reports. In the spring of 1973, flood waters from the Mississippi River inundated Site Q. This condition persisted into the fall, and operations at the site were discontinued. Exposed refuse was observed being carried downstream in the river at that time.

Sauget and Company filed a permit application to IEPA in 1972 for a proposed extension to the existing landfill. The proposed extension was located south of the Alton and Southern railroad tracks, and will be referred to as the southern extension. IEPA denied issuance of a permit for this extension several times, as Sauget and Company had filed repeated applications. Although approval of the southern extension was never issued, disposal operations continued in this area.

In the early 1970's, IEPA collected several samples from Site Q. Approximate sample locations are shown in Figure Q-1. Analytical data for samples collected from ponded water, leachate seeps, and groundwater are provided in Appendix F. The first set of samples, collected in October 1972, consisted of one sample from ponded water and one leachate sample. Results of these samples showed the presence of elevated levels of several metals; including copper, iron, lead, mercury, and zinc. Groundwater samples were collected in January 1973 from two monitoring wells at Site Q. Sample GW-1 showed trace levels of cadmium, silver, and phenols; while GW-2 showed very little evidence of contamination. Samples were again taken by the IEPA from ponded water at Site Q on two occasions in April 1973. Analytical results revealed low levels of boron, cadmium, copper, iron, lead, manganese, mercury, nickel, and zinc in sample P-2 and/or P-3. Although the data from samples collected in the early 1970's showed the presence of several contaminants, most notably phenol and heavy metals, no conclusive evidence of

contamination at Site Q was obtained.

IEPA collected samples from leachate seeps along the Mississippi River in October 1981 and again in September 1983. These locations may be found in Appendix F. Data for the 1981 samples revealed the presence of several metals as well as PCBs and phenols. September 1983 samples showed similar results.

The cinders and flyash used as cover materials at Site Q have been the subject of numerous investigations and complaints by the IEPA. In addition, the depth of final cover has been deemed inadequate. Illinois Pollution Control Board Case Number 77-84 was filed against Sauget and Company and Paul Sauget in May 1977. As a result of the findings in this case, a monetary penalty was invoked, and Sauget and Company was ordered to place two feet of suitable cover material on the entire site by February 1981. Sauget's failure to comply with these orders led the Illinois Attorney General's office to file a similar case. Site Q had been a chronic enforcement problem and Paul Sauget was found in contempt of court for failure to comply with court orders.

Laboratory tests run on the cinders and flyash indicate permeability values in the range of 9x10 -3 centimeters per second, which is considered unsuitable by IEPA. Recent flooding has also caused erosion of some of this material, thereby exposing new waste materials. In addition, metals analysis of the cover material

showed unacceptably high levels of arsenic, copper, lead, and zinc. In 1972, IEPA collected samples from stockpiled flyash at Site Q, and ran leach tests for inorganic constituents.

IEPA's Notices of Violations concerning disposal of chemical wastes at Site Q in early inspections are supported by more recent information. Notification of Hazardous Waste Site Forms were submitted to USEPA from three companies for this site: Browning-Ferris Industries, Clayton Chemical (as agent for Paul Sauget), and Pillsbury Company. These notices indicate disposal of organics, inorganics, solvents, pesticides, paint sludge, and unknown wastes at the site. In May 1980, workers uncovered buried drums and unknown wastes while excavating for construction of a railroad spur on the property. Workers observed a haze or smoke rising from the material after it was uncovered, suggesting corrosive and/or reactive properties.

As a result of the May 1980 incident, USEPA asked its FIT contractor (Ecology and Environment, Inc.) to perform a detailed study to determine the extent of chemical contamination at Site Q. The study included a systematic geophysical investigation using EM (electromagnetometry), and ground penetrating radar (GPR), followed by a drilling and sampling program to investigate possible subsurface contamination. The investigation was limited to the northern portion of the site which amounts to approximately 25 percent of the area.

Technos, Incorporated of Miami, Florida was contracted to perform the geophysical investigation. This investigation was completed in June 1983. Results of the geophysical investigation identified the probable limits of landfilling and burial zones of relatively large concentrations of iron bearing materials such as drums or car bodies. These iron bearing zones were found in several distinct locations in the north-central and western portions of the study area.

Following the geophysical investigation, a drilling/sampling program was conducted to determine if subsurface soils were contaminated. The program consisted of drilling 18 test borings through the landfill, and the collection of 35 soil samples for full priority pollutant analysis, as designated by USEPA. Subsurface soil samples were collected at depths ranging from 10 to 26 feet. A wide variety of organic compounds were detected at high concentrations in these samples. The samples were run for 112 organic compounds and 63 compounds were confirmed to be present in the subsurface samples. Compounds detected at 1000 ppb or greater include 2,4-dichlorophenol, 1,2,4-trichlorobenzene, 1,4-dichlorobenzene, bis(2-ethylhexyl)phthalate, toluene, o-xylene, and Arochlor 1260. Also, 2,3,7,8-tetrachlorodibenzo(p)dioxin was detected in two of the borings. Compounds detected in samples taken from Site Q included many of the compounds detected in samples taken from Site R. Contamination was detected across the entire area investigated, which suggested that disposal of large

quantities of chemical wastes occurred specifically in the northern portion of Site Q and probably over the entire site area.

In November 1985, IEPA received a sketch from a reporter for a St. Louis newspaper indicating the location of buried drums containing PCBs. The reporter's source of this information is not known, nor has the information been verified.

In August 1993, the Agency received a call from Explorer Pipeline of Tulsa, Oklahoma. They had flown over the flood-inundated Site Q and noticed that an oil sheen appeared on the river in the approximate location of one of their pipes. The pipe is entrenched at a depth of approximately four feet and lays at the southern point of the intersection of the Alton Southern railroad track and the Illinois Terminal Railroad Association track.

Explorer waited until the river receded before excavating to see if their pipe was leaking. Explorer began the operation in the middle of August. Upon excavating around their pipe, they noted that the coating in one area of the pipe had been eroded away. A seam of a greenish-yellow substance appeared in the soil surrounding that section of the pipe.

Based on this information, representatives of the IEPA conducted a site visit. Observing the area in question, IEPA decided that the substance in the excavation should be sampled.

Sampling at the excavation occurred on September 2, 1993. Sampling was performed by representatives of IEPA's Pre-Remedial Unit. A total of three surface water samples were taken; two samples from the excavation (with one used as a duplicate) and one from a flooded area to the south of the excavation, near a concrete culvert (Refer to Figure 2-10 for sampling locations). In addition, NONE three soil samples were taken as well: one sample from the excavation, one leachate from along the Mississippi River, and one from an area of discolored or stained soil. The excavation remains open, surrounded with warning tape.

Analysis of the samples revealed the presence of volatiles, semi-volatiles, pesticides, PCBs, and metals. Please refer to Appendix F for a sample summary.

During the March, 1994 ESI, the sampling team discovered a number of drums located along the riverbank. These drums have been sampled by both the Illinois EPA as well as the USEPA's Immediate Removal Team. High levels of PCBs were detected in the samples and plans are underway for these drums and affected soils to be removed.

2.3.5 Site R

Site R, also known as Sauget Toxic or River's Edge Landfill operated from 1957 until 1975. The landfill was operated by Sauget and Company and Industrial Salvage and Disposal under contract with Monsanto. According to information provided by the Eckhardt report

of 1979, Monsanto reported the disposal (for the year in question) of 262,500 tons of liquid and solid industrial wastes in the landfill from the Monsanto W.G. Krummrich Plant in Sauget and the J.F. Queeny Plant in St. Louis, Missouri. The W.G. Krummrich Plant listed the disposal of approximately 290,000 cubic yards of organics, inorganics, solvents, pesticides, and heavy metals. The J.F. Queeny Plant listed 6600 cubic yards of the same wastes. Information provided also listed the underground disposal of drums.

Disposal operations began in the northern portion of the site and as additional area was required, disposal activities were expanded toward the southern boundary of the landfill. Drilling logs indicate that the areas of waste disposal were covered or filled with flyash, cinders, sand and gravel.

In 1979, the landfill was covered with a clay cap and, according to drilling records, varies in thickness from a minimum of two feet to as much as eight feet thick.

In August, 1968, the Illinois Department of Public Health collected five groundwater samples from on-site monitoring wells. Phenols were detected in all wells at concentrations ranging from 15 to 1220 parts per billion. Alkalinity and total solids were analyzed for, but no significant conclusions could be made from the data for said parameters.

IEPA began making routine inspections at Site R in 1971. Photographs of the site at this time suggest that wastes were disposed of in direct contact with groundwater. No segregation of liquid wastes was apparent in these photographs. IEPA collected a number of samples from the monitoring wells in December, 1972. Analytical results of the samples indicate concentrations of iron, zinc, and phenol above the State's water quality standards. Oil was also detected in two wells.

In 1973, IEPA sent notices to Sauget and Company and Monsanto outlining violations of the Environmental Protection Act at Site R. Violations noted included inadequate segregation of wastes, open dumping of chemical wastes, and operation of a disposal facility without the necessary permits. In addition, it was noted that the cinders being used for cover material was not in accordance with the Rules and Regulations set forth by the Illinois Pollution Control Board. These violations were repeated several times in 1973 and 1974.

IEPA monthly inspection reports from 1975 indicate a significant reduction in the volume of chemical waste disposal at Site R. Wastes were being shipped to other unreported locations for disposal or were being incinerated at Monsanto's Krummrich Plant. Monsanto voluntarily ceased disposal operations at the site in 1977 and began closure proceedings. D'Appolonia Consulting Engineers, Incorporated was contracted by Monsanto to conduct a subsurface

investigation of the site. Twenty soil borings were drilled and eight monitoring wells were installed. The D'Appolonia study concluded that the landfill area consisted of five to twenty feet of flyash, cinders, silty clay, and unidentified waste. The landfill is underlain by alluvium, to 50 feet. Field permeability tests showed that silty sand is the major component of the alluvium. This finding is supported by the evidence of vertical migration of contaminants to a depth of 65 feet, as suggested in the boring logs. Water levels were generally 25 to 30 feet below surface.

In May, 1978, Monsanto filed closure documents to IEPA detailing a closure plan for the site. In general, the plan consisted of specifications for the installation of a drainage system and clay cap, along with details for grading, seeding, and access restriction. The Helmkamp Construction Company was retained to implement the closure plan. An IEPA inspection report from October, 1979 indicated that closure operations at Site R were complete, including installation of a clay cap three to six feet in thickness. In February, 1980, Richard Sinise, an Environmental Control Engineer for Monsanto, filed an Affidavit of Closure for Site R.

IEPA personnel sampled the wells installed by D'Appolonia in October, 1979. Analysis showed the presence of several organic contaminants in the wells, including: chlorotoluene, phenol,

chlorophenol, dichlorobenzene, and diphenyl ether. Some contaminants were detected at levels ranging from 0.81 to 2.1 ppm. Iron, copper, and zinc exceeded water quality standards in several wells.

In October, 1981, IEPA collected leachate and sediment samples at Site R from an area adjacent to the Mississippi River. Leachate and sediment samples were collected from three locations where leachate seeps were observed flowing from the landfill into the river. PCBs and chloroaniline were detected in all sediment samples. Other compounds detected in sediment samples included 2,4-dichlorophenoxyacetic acid (2,4-D), chloronitrobenzene, dichloroaniline, chlorophenol, and dichlorophenol. The presence of 2,4-D and chlorinated phenols in these samples suggested that dioxin was also a potential contaminant at the site. The IEPA subsequently requested assistance from USEPA in securing a laboratory to perform dioxin analysis on leachate samples from Site R. In November, 1981 a USEPA contractor (Ecology and Environment, Inc.) collected leachate and sediment samples at three locations adjacent to the river. A total of eight samples plus three blanks were collected. Dioxin analysis was performed by the Brehm Laboratory at Wright State University. Monsanto obtained split samples and analyzed for chlorinated dibenzo-p-dioxins (CDDs), select organics, and metals. The USEPA samples were analyzed for tetra through octa CDDs and dibenzofurans (CDFs), select organics, and metals. The results revealed the presence of higher chlorinated

dioxins and furans (hexa through octa isomers) in three of the five samples sent in for analysis.

Inorganic data for the leachate and sediment samples did not show significant inorganic contamination, however, concentrations of chromium, copper, boron, and iron exceeded water quality standards in two or more samples. Elevated levels of arsenic, chromium, copper, lead, and barium were found in several samples.

In 1982, the Illinois Attorney General's office filed suit (Complaint number 82-CH-185) against Monsanto outlining several apparent violations of the Illinois Environmental Protection Act. For the most part, the complaint was directed at alleged water pollution caused by the defendant. Relief requested by the Attorney General included civil penalties and issuance of an injunction directing the defendant to immediately prevent the seepage of wastes into the Mississippi River, and to remove all such wastes from the property. To date, no information has been located concerning a determination in this case.

Monsanto has hired Geraghty and Miller, Environmental Consultant, St. Louis, Missouri, to perform a Remedial Investigation - Feasibility Study as part of the consent order with the state of Illinois.

USEPA file information suggest that fish studies have been

conducted in the Mississippi River in the vicinity of Site R. The Food and Drug Administration (FDA) in Edwardsville, Illinois has found unacceptable concentrations of PCBs in fish collected downstream of Site R. A detailed study was proposed for the area in the immediate vicinity of the site, however, attempts to convince Monsanto to perform study have been unsuccessful to date. Monsanto believes the problem to be further complicated by the existence of the American Bottoms outfall, and will not conduct fish tissue sampling, as the American Bottoms outfall is located immediately northwest of Site R.

2.2.6 Site S

There is currently no file information available for this site, which was discovered through the use of historical aerial photographs provided to this agency by the Illinois Department of Transportation.

A study of the 1974 aerial photograph (Located in Appendix C) revealed the presence of approximately 200 drums in or around the disposal area. A road leading from Clayton Chemical can be noted in the photo.

SECTION 3

SITE INSPECTION ACTIVITIES AND ANALYTICAL RESULTS

3.1 INTRODUCTION

This section outlines procedures utilized and observations made during the CERCLA Expanded Site Inspection conducted at the Sauget Area 2 sites in Sauget, Illinois on March 16 and 17, 1994. Specific portions of this section contain information pertaining to the reconnaissance inspection and sampling procedures. This section also details the analytical results with particular emphasis upon the key samples.

The Expanded Site Inspection for the Sauget Area 2 Sites was conducted in accordance with the site inspection workplan which was developed and submitted to the USEPA Region V offices prior to the initiation of sampling activities.

3.2 RECONNAISSANCE INSPECTION

Several reconnaissance inspections of the Sauget Area 2 Sites have taken place throughout the past year in order to be sure that the area was looked at thoroughly, due to the size of the area in question. Sampling had initially been planned for the fall of 1993. However, due to the flooding of the area during the summer of 1993, this action was postponed until the waters receded.

3.3 SOIL/SEDIMENT/WASTE SAMPLING

On March 16 and 17, 1994, a total of sixteen soil/sediment/waste samples were collected during the CERCLA Expanded Site Inspection at the Sauget Area 2 sites (See Figure 3-1 for sampling locations). All samples were collected using stainless steel hand augers and/or hand shovels, with the exception of sample X101, which was obtained with the use of the Agency drill rig. The soil/sediment/waste was transferred directly from the hand tool and placed directly into the sampling jars, with the exception of the duplicate samples, which were mixed and then placed directly from the mixing pan into the jars.

Standard Illinois EPA decontamination procedures were followed prior to the collection of all samples. The procedures included the scrubbing of all equipment (hand shovels, buckets, augers, etc.) with non-foaming Alconox solution, rinsing with hot tap water, rinsing with acetone, rinsing with hot tap water again, and final rinsed with distilled water. All equipment was then air dried, wrapped and stored in heavy duty aluminum foil for transport to the field. Field decontamination procedures included rinsing the equipment with distilled water.

Sample X101 was taken in order to characterize the wastes in the landfill. Analytical results revealed the presence of volatiles, semi-volatiles, pesticides, PCBs, and metals. The sample was taken with the use of the Agency drill rig and the boring was

approximately 10.7-13 feet in depth.

Samples X102, X103, and X104 were taken in the wetland area along the western boundary of Site P. The samples were taken in order to characterize contamination in the wetland. The samples were taken approximately 300 feet apart in order to show contamination in a one-tenth of a mile length for HRS purposes.

Analytical results revealed the presence of semi-volatiles, PCBs, pesticides, and metals within the top two feet of soil.

Samples X105 and X106 were taken at Site O in order to characterize the waste in the lagoons. Analytical results revealed the presence of volatiles, semi-volatiles, pesticides, PCBs, and metals.

Samples X107-X109 were taken in the borrow pits at the southern end of Site Q. They were taken in order to further characterize the waste in the pits. The samples were taken at the surface and approximately 300 feet apart in order to show contamination in a tenth of a mile wetland frontage for HRS purposes.

Analytical results revealed the presence of semi-volatiles, pesticides, PCBs, and metals.

Samples X110-X112 were taken as surface samples at Site Q (within the top two feet) in order to characterize the wastes at the site.

The site was inundated with floodwaters during the summer of 1993. Analytical results revealed the presence of volatiles, semi-volatiles, pesticides, PCBs, and metals.

Samples X501 and X502 were waste samples taken from two separate drums located at Site Q. These samples were taken in order to characterize the waste in the drums.

3.4 ANALYTICAL RESULTS

Chemical analysis of the sixteen samples collected during the inspection revealed the presence of elevated concentrations of the following: volatiles, semi-volatiles, pesticides, metals, suspected laboratory artifacts, and common inorganic soil constituents. Table 3-3 in Appendix D provides a summary of analytical results. Complete analytic results can be found in Volume II of this report.

3.5 KEY SAMPLES

Table 3-2 identifies those samples taken during the CERCLA Expanded Site Inspection which were shown to contain contaminants at significant levels.

Source: IEPA, 1994. Base Map: Illinois Department of Transportation, 1974.

Figure 3-1

Scale 1;1800

1994 ESI SAMPLE LOCATION MAP

CERCLA Expanded Site Inspection - Sauget Area 2

TABLE 3-1

SAMPLE	DESCRIPTION	LOCATION	DEPTH
X101	BLACK AND SLUDGE-LIKE WITH DEBRIS. FINE-GRAINED SILT WITH ODOR.	SITE P. LOCATED APPROXIMATELY 90 FEET WEST OF POWER POLE A AND 14 FEET NORTH OF NORTH OF POWER POLE A.	10.7-13 FEET
X102	BLACK, SANDY WITH CLAY.	WETLAND AREA ALONG WESTERN BOUNDARY OF SITE P. 202 FT WEST OF POWER TOWER A AND 130 FEET EAST OF RAILROAD TRACKS ALONG WESTERN BOUNDARY.	1-5 INCHES
X103	BLACK, COARSE-GRAINED SAND 0-4" THEN SILTY.	LOCATED 350 FEET SOUTH OF SAMPLE APPROXIMATELY 30 FEET WEST OF LANDFILL EMBANKMENT.	0-5 INCHES
X104	BLACK, SILTY, FINE-GRAINED.	LOCATED DIRECTLY WEST OF P.T.S SHOWCLUB, APPROXIMATELY 15 FEET WEST OF EMBANKMENT.	0-4 INCHES 0-.33
X105	BLACK, CLAY-LIKE MATERIAL, MIXED WITH A RUBBERY SUBSTANCE.	LOCATED 259 FEET EAST OF ACCESS ROAD AND 430 FEET SOUTH OF NORTHERN PORTION OF ACCESS ROAD.	6-7 FFET
X106	BLACK, WITH SILTY CLAY. BLACK SUBSTANCE WAS CINDER-LIKE.	LOCATED APPROXIMATELY 173 FEET WEST OF ACCESS ROAD AND 264 FEET NORTH OF SOUTHERN PORTION OF ACCESS ROAD.	2 FEET 2-2
X107	DARK BROWN TO BLACK, SILTY AND MOIST.	LOCATED AT SOUTHEASTERN-MOST PART OF BORROW PIT.	4-6 INCHES .33-.5
X108	BLACK, SILTY AND SANDY WITH ORGANIC MATERIAL.	LOCATED 300 FEET WEST OF X107.	5-8 INCHES .42-.67
X109	DARK BROWN TO BLACK AND THEN SANDY WITH SOME CLAY.	LOCATED 300 FEET NORTH OF SAMPLE X107.	3-4 INCHES .25-.42
X110	A LAYER OF BLACK, SILTY , SANDY MATERIAL WITH CINDERS WITH A PASTY, YELLOWISH SUBSTANCE.	LOCATED 213 FEET NORTH-NORTHEAST OF POWER TOWER B.	2-8 FEET
X111	BLACK, TAR-LIKE.	LOCATED APPROXIMATELY 5 FEET TO THE WEST OF X110.	1/4-1 INCH 0-.08
X112	BLACK ON TOP; RUBBERY, WITH PURPLISH "GOO" FLOWING TO THE SURFACE. UNDER THIS LAYER WAS A BROWNISH-RED WITH YELLOW RUBBERY SUBSTANCE.	LOCATED 125 FEET EAST OF SITE R FENCE AND 24 FEET SOUTH OF RIVERSIDE ROAD.	0-3 INCHES 0.-.25
X113 X114	DARK-BROWN, SILTY, FINE.	LOCATED 62.5 FEET SOUTHEAST OF POWER TOWER C	2-4 INCHES .17-.33
X501	ORANGE AND PURPLE CRYSTALLINE MATERIAL.	TAKEN FROM DRUM LOCATED IN LOW AREA NEXT TO SITE Q EXCAVATION - SEVENTY-SEVEN FEET, SEVEN INCHES SOUTH-SOUTHEAST OF TELEPHONE POLE NORTHEAST OF INTERSECTION OF ACCESS ROAD AND ALTON AND SOUTHERN RAILROAD TRACKS.	
X502	BLACK, CINDER-LIKE MATERIAL.	TAKEN FROM DRUM LOCATED ALONG MISSISSIPPI RIVER RIVERBANK.	

SAUGET AREA #2

ILD See CERCLIS	Site P				Site O	
SAMPLING POINT	X101	X102	X103	X104	X105	X106
PARAMETER	soil	soil	soil	soil	soil	soil
VOLATILES						
Methylene Chloride		4.0 J	5.6 J	[illegible]		[illegible] J
Acetone	73.0	37.0				
Carbon Disulfide	16.0		5.6 J	[illegible]		
1,1-Dichloroethene		180.0				
1,2-Dichloroethene (total)	4.0 J	23.0				
Chloroform					2800.0 J	
2-Butanone	37.0	5.0 J				
1,1,1-Trichloroethane	4.0 J	130.0			12000.0	
Trichloroethene	8.0 J	11.0 J			6700.0 J	
1,1,2-Trichloroethane		4.0 J				
Benzene				[illegible] J		610.0 J
4-Methyl-2-Pentanone	58.0				30000.0	
2-Hexanone						
Tetrachloroethene	140.0				9000.0 J	
Toluene	110.0			[illegible] J		940.0 J
Chlorobenzene	42.0			460000.0 J		18000.0
Ethylbenzene	90.0			[illegible] J		1300.0 J
Styrene						
Xylene (total)	360.0			[illegible] J		4000.0
ug/Kg						
SEMI-VOLATILES						
Phenol						41000.0 J
2-Chlorophenol						94000.0 J
1,3-Dichlorobenzene	4200.0 J					[illegible]
1,4-Dichlorobenzene	1300000.0	130.0 J			350000.0	17000000.0 J
1,2-Dichlorobenzene	120000.0 J				580000.0	[illegible]
4-Methylphenol				2300.0		
Isophorone						
2-Nitrophenol						120000.0
2,4-Dichlorophenol					88000.0 J	395000.0
1,2,4-Trichlorobenzene					140000.0 J	35000.0 J
Naphthalene					150000.0 J	29000.0 J
2-Methylnaphthalene				840.0 J	580000.0	
2,4,6-Trichlorophenol						130000.0
2-Nitroaniline						160000.0 J
Fluorene					82000.0 J	
2,4,5-Trichlorophenol		810.0 J				
Pentachlorophenol					1300000.0	940000.0 J
Phenanthrene		180.0 J	570.0 J			
Di-n-Butylphthalate	3900.0 J	300.0 BJ	1000.0 BJ	940.0 BJ		
Fluoranthene			980.0 J	2400.0 J	95000.0 J	
Pyrene			720.0 J	1700.0 J	940000.0	
Butylbenzylphthalate					83000.0 J	12000000.0
Benzo(a)Anthracene		140.0 J		1100.0 J	400000.0	
Chrysene		140.0 J	600.0 J	2200.0 J	870000.0	
bis(2-Ethylhexyl)Phthalate				920.0 J		
Benzo(b)Fluoranthene		160.0 J	720.0 J	3800.0	160000.0 J	
Benzo(k)Fluoranthene		150.0 J	660.0 J	1900.0 J		
Benzo(a)Pyrene		140.0 J		1800.0 J	180000.0 J	
Indeno(1,2,3-cd)Pyrene			790.0 J	2000.0 J		
Dibenz(a,h)Anthracene					100000.0 J	
Benzo(g,h,i)Perylene			520.0 J	2000.0 J		
ug/Kg						
PESTICIDES						
alpha-BHC						
beta-BHC				8.6 P		25000.0 UX
delta-BHC		18.0 BP	190.0 B			
gamma-BHC (Lindane)		3.0 P		8.7 P	170000.0 UX	25000.0 UX
Dieldrin						
4,4'-DDE	32.0 P	57.0 P				
Endrin						
4,4'-DDD		28.0 P	28.0 P	46.0 P	330000.0 UX	
Endosulfan sulfate						
4,4'-DDT		32.0 BP	46.0 BP	140.0 BP	330000.0 UX	48000.0 UX
Methoxychlor	190.0 P					
Endrin Ketone	52.0				330000.0 UX	48000.0 UX
alpha-Chlordane	62.0 BP					
gamma-Chlordane		10.0 P	36.0 P			25000.0 UX
Toxaphene						
Aroclor-1242		560.0	1500.0	1700.0	2900000.0 C	170000.0 C
Aroclor-1254		1100.0	3400.0	3600.0	530000.0 BC	150000.0 C
Aroclor-1260	570.0 B	1400.0 B	4060.0 B	4800.0 BC	530000.0 BC	95000.0 BC
ug/Kg						
INORGANICS						
Aluminum	12100.0	6860.0	13600.0	10400.0	3430.0	8470.0
Antimony					61.2	
Arsenic	14.8	94.7	27.6	14.3	129.0	10.9
Barium	228.0	74.8	101.0	180.0	1010.0	368.0
Beryllium	0.7 B	0.1	0.7	1.4 B		0.6 B
Cadmium	3.0	5.8	13.5	36.9	2570.0	11.9
Calcium	84400.0	22800.0	40200.0	88400.0	6850.0	11800.0
Chromium	90.8	87.7	98.5	39.2	182.0	94.6
Cobalt	6.1 B	28.6	61.6	17.7	38.3	6.6 B
Copper	35.2	96.2	167.0	231.0	9160.0	332.0
Iron	21600.0	19500.0	17900.0	18700.0	43100.0	14400.0
Lead	217.0	130.0	302.0	578.0	7190.0	98.4
Magnesium	11800.0	4070.0	9400.0	8640.0	1900.0	6930.0
Manganese	34.2	132.0	298.0	360.0	1360.0	256.0
Mercury	0.6	1.0	1.4	0.4	1394.0	14.4
Nickel	24.6	105.0	66.6	48.6	125.0	61.7
Potassium	4840.0	1810.0 B	2170.0	1860.0	786.0 B	909.0
Selenium	17.0	6.7	5.6	8.4	106.0	2.3
Silver		1.3 B	1.3 B	2.4 B	29.4	1.7 B
Sodium	3290.0	553.0 B	282.0 B	206.0 B	427.0 B	184.0 B
Thallium	6.0	1.9 B	2.6	0.4 B	2.4	
Vanadium	45.9	44.0	58.3	38.2	58.8	25.3
Zinc	1310.0	896.0	1520.0	4080.0	80400.0	954.0
Cyanide	2.6				6.6	
mg/Kg						

SAUGET AREA #2

LD See CERCLIS	Site Q								Drums at Site Q	
SAMPLING POINT	X107	X108	X109	X110	X111	X112	X113	X114	X501	X502
PARAMETER	soil	soil	soil	soil	soil	soil	soil	soil	drum waste	drum waste
VOLATILES										
Methylene Chloride			4.0 J	5.0 J	1160.0 J	7.0 BJ		5.0 J	15.0 B	14.0 B
Acetone				110.0		130.0			39.0	11.0
Carbon Disulfide										
1,1-Dichloroethene										
1,2-Dichloroethene (total)										
Chloroform										
2-Butanone				200.0		16.0			7.0 J	12.0
1,1,1-Trichloroethane										8.0 J
Trichloroethene						5.0 J				
1,1,2-Trichloroethane										
Benzene				4.0 J						
4-Methyl-2-Pentanone										
2-Hexanone						5.0 J				
Tetrachloroethene										
Toluene									6.0 J	4.0 J
Chlorobenzene				3.0 J						
Ethylbenzene										
Styrene									5.0 J	
Xylene (total)				5.0 J		5.0 J			990.0	
ug/kg										
SEMI-VOLATILES										
Phenol										
2-Chlorophenol										
1,3-Dichlorobenzene					see which					
1,4-Dichlorobenzene					data?	high detect				
1,2-Dichlorobenzene						values				
4-Methylphenol										
Isophorone		340.0 J								high detect
2-Nitrophenol										values
2,4-Dichlorophenol										
1,2,4-Trichlorobenzene										
Naphthalene		150.0 J								
2-Methylnaphthalene										
2,4,5-Trichlorophenol										
2-Nitroaniline										
Fluorene										
2,4,6-Trichlorophenol										
Pentachlorophenol		160.0 J								
Phenanthrene							170.0 J			
Di-n-Butylphthalate	810.0 B	1200.0 B	820.0 B				1300.0 B	1300.0 B	860.0 B	
Fluoranthene		110.0 J					300.0 J	190.0 J		
Pyrene		100.0 J					340.0 J	300.0 J		
Butylbenzylphthalate	360.0 U									
Benzo(a)Anthracene	410.0 J	99.0 J					340.0 J	230.0 J		
Chrysene	290.0 J						230.0 J	190.0 J		
bis(2-Ethylhexyl)Phthalate		2000.0						160.0 J		
Benzo(b)Fluoranthene	410.0 J						340.0 J	220.0 J		
Benzo(k)Fluoranthene							130.0 J	100.0 J		
Benzo(a)Pyrene							280.0 J	210.0 J		
Indeno(1,2,3-cd)Pyrene										
Dibenz(a,h)Anthracene										
Benzo(g,h,i)Perylene							270.0 J			
ug/Kg										
PESTICIDES										
alpha-BHC				2.0 JP						
beta-BHC										
delta-BHC	4.8 BP	13.0 BJP		46.0 B	46.0 BP	19000.0 UX	8.0 BP	4.8 BP		
gamma-BHC (Lindane)							8.4 JP	1.2 JP		
Dieldrin		380.0 P	16.0 P				23.0	26.0	6.8 JP	250000.0 UX
4,4'-DDE					74.0 P					
Endrin			47.0 BP							
4,4'-DDD	27.0 P	66.0 P	2.6 JP		29.0 P	38000.0 UX	17.0 P	14.0 P	6.1 JP	490000.0 UX
Endosulfan sulfate			1.5 JP							
4,4'-DDT	27.0 BP	82.0 BP	2.4 JP		84.0 BP		16.0 BP	13.0 BP		
Methoxychlor						190000.0 UX			8.7 BJ	
Endrin Ketone	46.0 P	120.0 P	4.8 P		190.0 P	38000.0 UX				
alpha-Chlordane		6800.0 UX							6.4 JP	250000.0 UX
gamma-Chlordane	44.0 P	140.0 P	2.7 P		15.0 P	3300 P	8.0 P	5.4 P		
Toxaphene				5600.0						
Aroclor-1242	1300.0 P		110.0		670.0	80000.0 C	220.0	190.0		7400000.0 PC
Aroclor-1254	6200.0 C		670.0	2200.0	1600.0	80000.0 C	880.0	580.0		
Aroclor-1260	7700.0 BC	17000.0 BC	450.0	1700.0 B	2000.0 B	42000.0 BC	710.0 B	720.0 B	22.0 BJ	44000000.0 BC
ug/Kg										
INORGANICS										
Aluminum	22000.0	19100.0	8110.0	1550.0	9470.0	1980.0	13900.0	15900.0	105.0	220.0
Antimony										
Arsenic	5.1	4.7	2.3 B	1.9 B	6.8	5.9	5.9	7.2		
Barium	190.0	260.0	72.9 B	109.0	360.0	104.0	230.0	230.0	2.7 B	4.0 B
Beryllium		0.8 B	0.3 B		0.6 B	0.2 B	0.7 B	0.6 B		
Cadmium	3.0	13.1			8.2	3.0	5.5	3.0		
Calcium	10100.0	7900.0	4170.0	99050.0	108000.0	10800.0	7700.0	7730.0	190.0 B	21800.0
Chromium	31.2	66.7	7.9	6.6	19.2	7.4	21.2	22.5		6.5
Cobalt	9.6 B	6.7 B	3.2 B		6.6	3.7	7.5 B	9.3 B		
Copper	46.3	82.7	5.9 B	6.4	97.7	57.9	56.6	66.1	1.2 B	7.5
Iron	24400.0	21200.0	9050.0	1606.0	15100.0	4160.0	24000.0	23600.0	105.0	7810.0
Lead	72.4	219.0	12.1	29.0	132.0	36.1	66.0	66.3	25.5	11.3
Magnesium	6350.0	4900.0	2800.0	1360.0	5170.0	1700.0	6900.0	4500.0	36.7 B	907.0 B
Manganese	287.0	253.0	94.7	36.8	182.0	104.0	283.0	278.0	7.3	50.6
Mercury	0.1 B	0.1 B		0.2 B	0.3	0.2	0.2	0.2		
Nickel	32.0 B	33.8 B	13.7		36.0	12.3	27.0	30.0	3.8 B	17.9
Potassium	2840.0 B	2220.0 B	895.0 B	5180.0 B	3960.0	907.0 B	3040.0	3520.0		
Selenium	0.4 B	1.4 B		1.0	1.0	0.3 B				
Silver		150.0 B								
Sodium	165.0 B	156.0 B	90.3 B	1070.0 B	227.0 B	397.0 B	217.0 B	224.0 B	115.0 B	
Thallium										
Vanadium	50.0	34.4	15.5	11.5	27.2	15.9	34.7	27.6	0.7 B	2.0 B
Zinc	321.0	599.0	57.9	65.7	729.0	349.0	486.0	466.0	4.5	36.8
Cyanide										
mg/Kg										

SECTION 4

IDENTIFICATION OF SOURCES

4.1 INTRODUCTION

This section discusses each of the hazardous waste sources which have been identified during the CERCLA Expanded Site Investigation of the Sauget Area 2 Sites. Section 1.1 of the revised Hazard Ranking System (HRS) defines a "source" as: "Any area where a hazardous substance has been deposited, stored, disposed, or placed, plus those soils that have become contaminated from migration of a hazardous substance." This does not include surface water sediments or surface water that has become contaminated. Information concerning the location, physical description, use, period of operation, size, and potential to affect the migration pathways along with analytical data obtained during the Expanded Site Inspection (ESI) is presented for each source.

4.2 SAUGET SITE O / SAUGET WASTEWATER TREATMENT PLANT LAGOONS

The former village of Sauget Wastewater Treatment Plant lagoons were used to dewater sludge from the treatment plant. The lagoons were in operation from 1967 until approximately 1980. Effluent from the various industries in the area ended up at the plant for treatment. The following is a list of those industries that discharged to the treatment plant from 1967 to 1980:

Clayton Chemical Company
Amax Zinc Company
Cerro Copper
Midwest Rubber Reclaiming
Mobil Oil Corporation
Monsanto
Wiese Planning and Engineering
Sterling Steel Foundry, Inc.
Rodgers Cartage
Ethyl Petroleum Additives/Edwin Cooper
Kerr-McGee/Moss American

The four lagoons are approximately twenty acres in size (total). Analytical results of samples taken during the ESI of March, 1994 revealed the presence of numerous compounds of concern, including the following:

Volatiles:

Chlorobenzene	15000	ppb
1,1,1-Trichloroethane	12000	ppb

Semi-volatiles:

1,3 Dichlorobenzene	20000	ppb
1,4 Dichlorobenzene	1700000	ppb
2-Nitrophenol	120000	ppb
2,4 - Dichlorophenol	250000	ppb
2,4,6 Trichlorophenol	130000	ppb
Pentachlorophenol	13000000	ppb
Benzo(a)pyrene	160000	ppb

Pesticides/PCBs

Arochlor (1242)	2900000	ppb
Arochlor (1254)	100000	ppb
Arochlor (1260)	530000	ppb

Inorganics

Antimony	61.2	ppm	Mercury	1584	ppm
Arsenic	120.2	ppm	Nickel	125	ppm
Barium	1010	ppm	Selenium	108	ppm
Cadmium	2370	ppm	Silver	29.8	ppm
Chromium	192	ppm	Vanadium	58.6	ppm
Copper	9160	ppm	Zinc	60400	ppm
Lead	7180	ppm	Cyanide	6.6	ppm
Manganese	1360	ppm			

Pathways of concern include surface water (groundwater to surface water flow) and the air migration pathway. Groundwater and soil exposure are not evaluated for this pathway due to the lack of targets.

4.3 SAUGET SITE P / P.T. S SHOWCLUB

The Illinois EPA permitted Site P was operated by Paul Sauget from 1972 until 1984. The landfill was permitted to accept non-chemical solid waste from Monsanto and Ethyl Corporation. The property was leased from Union Electric of St. Louis. The landfill is unlined, has no leachate collection system and is covered with cinders, ash, and slag from a Southern Railway slag pile.

In January, 1973, IEPA issued a permit for the landfill to accept diatomaceous earth filter cake from Edwin Cooper, Incorporated (now Ethyl Corporation).

Although the landfill was permitted to accept only non-chemical waste, several violations of the permit were noted by the Collinsville Field Office. In October, 1975, an inspector noted a

yellowish tar-like liquid in an area adjacent to several crushed fiber drums which were labelled "Monsanto ACL-85, Chlorine Composition." Sauget and Company and Monsanto were notified of this violation and the matter was not further addressed. In December, 1977, an inspection revealed the presence of approximately 25 metal containers (12-15 gallon) full of phosphorus pentasulfide (P2S5), a flammable solid. IEPA required Monsanto to excavate and remove all of this material from the site, and to discontinue disposal of any chemical wastes or packaging.

IEPA inspection of the landfill in 1978 and 1979 indicated non-permitted disposal of Monsanto ACL filter residues and packages. The composition of this material is not known. According to the site operator at that time, this material would occasionally ignite when it came into contact with the filter cake from Edwin Cooper.

Analytical results from the March 1994 CERCLA ESI revealed the presence of the following:

Volatiles: (ppb)

Acetone -	73
Carbon Disulfide -	16
1,1-Dichloroethane -	160
1,1,1-Trichloroethane -	130
Tetrachloroethene -	140
Chlorobenzene -	42
BTEXs - (total)	420

Semi-Volatiles: (ppb)

1,3-Dichlorobenzene -	4200
1,4-Dichlorobenzene -	1300000
1,2-Dichlorobenzene -	120000
2,4,5-Trichlorophenol -	310
Chrysene -	2200
Benzo(a)Pyrene -	1600

Pesticides/PCBs (ppb)

4,4'DDE -	37	gamma-Chlordane -	36
4,4'DDD -	46	Arochlor -	4600
4,4'DDT -	140	Endrin Ketone -	52

Inorganics (ppm)

Arsenic -	34.7	Magnesium -	8460
Barium -	226	Manganese -	389
Cadmium -	32.9	Mercury -	5.6
Chromium -	60.6	Nickel -	105
Cobalt -	28.6	Zinc -	4030
Lead -	378	Cyanide -	2.6

Pathways of concern at this source include surface water (wetland), including groundwater to surface water, soil exposure and air. The groundwater pathway was not fully evaluated due to the lack of targets.

4.4 SAUGET SITE Q / SAUGET AND COMPANY LANDFILL

The unpermitted Sauget and Company landfill was operated by Paul Sauget from 1962 to 1975. The site is approximately 90 acres in size, including the southern extension, as delineated by the Alton and Southern Railroad. The site is located in the Mississippi River

floodplain; along the river's bank and on the west side of the U.S. Army Corps of Engineers flood control levee and is situated immediately east of Site R.

The site is unlined, uncapped, has no system for leachate collection or run-on/run-off control, and is covered with cinders and flyash. The landfill served as a municipal landfill for the village of Sauget as well as an industrial landfill for the various industries in the St. Louis area.

Peavey Grain, River City Landscape Supply and Bauer Construction are currently operating at the site. They employ 25, 20, and one person respectively.

The landfill was inundated with waters from the Mississippi River during the flood of 1993 as well as the flood of 1973.

Analytical results from the March, 1994 CERCLA ESI revealed the presence of volatiles, semi-volatiles, PCBs, pesticides, and metals. Contaminants of concern include the following:

Volatiles: (ppb)

Methylene Chloride	1100

Semi-Volatiles: (ppb)

Phenanthrene	170
Benzo(a)Anthracene	410
Benzo(a)Pyrene	250

Pesticides/PCBs: (ppb)

Dieldrin	380
4,4'DDD	69
4,4'DDE	74
4,4'DDT	82
Endrin ketone	130
gamma-Chlordane	330
Arochlor 1260 (soil)	42000
Arochlor 1260 (drum)	44000000

Inorganics: (ppm)

Arsenic	8.8	Magnesium	9190
Barium	323	Manganese	287
Cadmium	13.1	Mercury	4.9
Chromium	93.7	Vanadium	50.8
Lead	218	Zinc	798

4.5 SAUGET SITE R / RIVER'S EDGE LANDFILL - SAUGET TOXIC

The Monsanto-owned chemical landfill was operated by Sauget and Company and Industrial Disposal from 1957 until 1975. The site is approximately 36 acres in size and is located along the banks of the Mississippi River on the west side of the Army Corps of Engineers flood control levee.

The site is capped with an engineered and maintained cover. Leachate collection systems exist along the sides of the landfill and access to the landfill is barred by an eight foot fence and security cameras.

Analytical results from groundwater and soil samples provided to the Agency by Geraghty and Miller, consultants for the Monsanto Company revealed the presence of volatiles, semi-volatiles,

pesticides, PCBs, and metals. Contaminants of concern include the following:

Volatiles: (ppb)

Groundwater: Phenol - 13000DJ
2-Chlorophenol - 2300J

Soil: Chlorobenzene - 4400J
Xylenes - 4500
4-Methyl-2-Pentanone - 240000J
Tetrachloroethene - 1400000J

Semi-volatiles: (ppb)
Soil: Pentachlorophenol - 240J
Phenol - 1400J
1,4-Dichlorobenzene - 4700
Benzo(a)pyrene - 3700J
2-Chloroaniline - 4800

Pesticides/PCBs: (ppb)
Soil: Arochlor 1260 - 6600

Inorganics:
Groundwater: Antimony - 72.3 ppb
Arsenic - 27.7 ppb
Barium - 403 ppb
Manganese - 20400 ppb

Soils: Barium - 268 ppm
Manganese - 384 ppm

4.6 SAUGET SITE S / DRUM DISPOSAL AREA

Currently, there is no file information available to the Agency concerning the operational history of this site. No sampling has occurred at the site, however, the Agency is planning to conduct a study of the site in the fall of 1994. It has been added to the Area 2 Sites due to its proximity to the other Area 2 Sites and the belief that the site was operated by the same operator as the other Area 2 Sites.

SECTION 5

MIGRATION PATHWAYS

5.1 INTRODUCTION

This section includes data and information which may be useful in analyzing the impact of the Sauget Area 2 Sites on the four migration pathways identified in the CERCLA Hazard Ranking System (HRS). The four migration pathways are groundwater, surface water, air, and soil exposure.

5.2 GROUNDWATER

The Sauget Area 2 Sites are located in a region known as the American Bottoms. Well logs provided to the IEPA from the Illinois State Water Survey (ISIS) indicate that the upper stratigraphy in this region consists of 70-120 feet of unconsolidated alluvium and glacial outwash overlying Mississippian-aged limestone and sandstone formations (Ste. Genevieve and St. Louis limestones). The valley fill deposits are composed of two formations, the uppermost being the Cahokia Alluvium followed by the Mackinaw Member of the Henry Formation.

The Cahokia Alluvium is composed predominantly of silt, clay, and fine sand deposits, generally indicative of an aggrading environment. In the Sauget area, these deposits vary in thickness, with a range of 15 to 30 feet. This formation was laid down via flood events, eolian activity, bank slumping, erosion and/or slugs

of material deposited directly by tributary streams. The Mississippi River has frequently reworked this formation in such a way that coarser material is intermingled with finer-grained deposits.

Underlying the Cahokia Alluvium is the Mackinaw Member of the Henry Formation. This formation is composed of sand and gravel from glacial outwash. In the Sauget area, this material rests directly on the bedrock surface and varies between 70 and 100 feet in thickness.

Local hydrogeologic information has been obtained through groundwater monitoring in the Sauget area. In the vicinity of the Area 2 Sites, shallow sand and gravel deposits close to the ground surface yield significant quantities of water for nearby homes and business. Horizontal groundwater movement in the shallow deposits generally follow the land surface topography., with lateral movement toward local discharge zones (wells and small streams), and some movement into the deeper unconsolidated aquifers. Groundwater is encountered between 10 and 28 feet below the ground surface in the area. These figures can be used for the depth of aquifer of concern (AOC). Groundwater in the deeper unconsolidated valley fill deposits generally follows the bedrock surface. Accordingly, groundwater generally flows downstream through the sand and gravel aquifers in much the same direction as the original stream flow, but at a much slower rate.

Most area residents are supplied with drinking water by the Illinois-American Water Company (IAWC) which operates an intake on the Mississippi River upstream of Sauget. IAWC sells water to various water departments and districts within the Sauget/Cahokia area. However, some area residents do obtain drinking water from shallow wells. Illinois Department of Public Health (IDPH) files and Illinois State Water Survey (ISWS) well logs indicate at least 50 residents have wells which are used for drinking or irrigation. These wells are located in Cahokia (23), East St. Louis (5), East Carondolet (16) and Dupo (6). These do not include the wells at the homes on Judith Lane in Cahokia or an unknown number of residents in the Schmids Lake area (approximately 2.3 miles southwest) that are not covered by any public water distribution. A 1983 report by the Southwestern Illinois Metropolitan and Regional Planning Commission (SIMRPC) listed 69 residences in Centreville Township (includes Sauget, Cahokia, Alorton, and Centreville) which use private water systems. The same report lists 57 residences in East St. Louis and 365 residences in Sugarloaf Township (includes Dupo and East Carondolet). SIMRPC based their report on 1980 census data.

5.3 SURFACE WATER PATHWAY

Site drainage is controlled by the Army Corps of Engineers 500 year levee for Sauget Area 2 Sites O, P, and S. Sites Q and R are west of the levee are not protected from the river's flood events, such as those of 1973 and 1993. Drainage from these two sites enter the

Mississippi directly. There are numerous probable points of entry (PPE) as there are numerous leachate seeps and Site Q's pipe which are all located along Sites Q and R. The American Bottoms outfall at river mile 178.2 would be the PPE for the three sites east of the levee. A 15-mile surface water map is included in Appendix B of this report.

The average discharge of the Mississippi River, as measured over a 128 year period at St. Louis, Missouri, is 179,800 cubic feet per second. The 15-mile surface water target distance limit extends to Mississippi River mile 163.2.

Surface water use in the immediate area (from Mississippi River mile 178 to 174) is limited to recreation and freight trafficking. There is an upstream surface water intake at river mile 181, which supplies most of the Illinois residents within a four-mile radius of the site. The city of St. Louis is also supplied by an upstream surface water intake, about 12 miles north at river mile 190. At downstream river mile 149 (about 20 river miles south of the area), the village of Festus, Missouri (population 10,000) utilizes a Ranney well, adjacent to the Mississippi River, for drinking water. A well of this type is assumed to draw in surface water due to its construction and location to the river. On the Illinois side, the nearest downstream surface water intake is located approximately 65 miles south of the Sauget Area 2 sites, at river mile 110. The intake is used by the town of Chester and surrounding communities

in Randolph County.

The Illinois Department of Conservation (IDOC)'s Resource Inventory for the Mississippi River (between river miles 178-162) shows fish spawning areas, commercial fishing areas, sport fishing areas, important wildlife habitat and bald eagle use at selected areas within the 15-mile target distance limit.

Annual fish production is reported to be approximately 21,738 pounds within the target distance limit. This figure is based on data available for the harvest between river mile 0 and 200.5 was averaged over two years divided by 200.5 river miles, and multiplied by the number of miles in the target distance limit (TDL) to estimate the annual production of the Mississippi River fishery.

Numerous environmentally sensitive areas are located within the 15-mile TDL. According to the U.S. Department of the Interior's National Wetland Inventory maps, there are several wetland areas located on the sites themselves. Three wetlands are located on Site Q and two on Site P.

5.4 SOIL EXPOSURE/DIRECT CONTACT

Under this pathway, workers located within 200 feet of known contamination were considered. Site O has approximately 50 workers,

and contaminants were detected at a depth of one and one-half to four feet. Site O is surrounded on two sides by fencing which also surrounds the American Bottoms Regional Treatment Plant. An access road cuts across lagoon number three. Therefore, access is not limited.

P.T.s Showclub is situated on top of Site P and employs approximately 35 persons. The showclub is located within 200 feet of samples taken, which show Level 1 concentrations of PCBs and metals. No barrier exists between areas of observed Level 1 contamination and public roads and the showclub.

There are three separate operations located at Site Q, according to Mr. Richard Burke, President of Eagle Marine Industries, Incorporated of St. Louis and owner of Site Q. River City Landscaping of St. Louis operates a section near the southern section of the main portion of Site Q and employs approximately 20 people. Peavey Grain Company operates near mid-Q and employs approximately 25 persons. Bauer construction is in the process of storing concrete with rebar on the southern part of the main portion of Q. Bauer Construction will be separating the concrete from the rebar, producing gravel from the concrete and spreading it on Site Q.

There are currently no workers operating at Site R.

5.5 AIR PATHWAY

Documented releases to the ambient air were observed in the 1988 Ecology and Environment study of the sites. Also, the elevated HNu readings during the site reconnaissance at Site O in June, 1991, denotes off-gassing of contaminants in the soil. It has been estimated that approximately 2000 people live within a mile of the Area 2 sites and approximately 175,000 people live within a four mile radius of the sites, based upon 1990 U.S. Census Bureau figures. The table below shows the four-mile radius population calculation. According to the Illinois Department of Commerce and Community Affairs (1988), approximately 3200 people are employed within two miles of the site.

Target Population Calculation

City	Population Density/ Total Population	Area w/in 4-Mile Radius	Population w/in 4-mile radius
St. Louis	7,379/sq mi	14.5 sq mi	106,995
E. St. Louis	4,119/sq mi	9.5 sq mi	39,130
Alorton	2,237	100%	2,237
Cahokia	18,904	100%	18,904
Centreville	9,747	75%	7,310
Unincorporated Areas			

Total Target Population = 174,576

Also of concern in the air pathway are the numerous wetland areas which exist within a four mile radius of the sites. A map showing the se areas may be found in Appendix C. A Bald Eagle nesting area is present on the south tip of Arsenal Island, approximately 2.5 miles southwest of the Sauget Area 2 Sites.

SECTION 6

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Exhibit 3

REF 3a

EXPANDED SITE INVESTIGATION
DEAD CREEK PROJECT SITES
AT CAHOKIA/SAUGET, ILLINOIS
FINAL REPORT
VOLUME 1 OF 2

May 1988

Prepared for:

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
Division of Land Pollution Control
2200 Churchill Road
P.O. Box 19276
Springfield, Illinois 62794-9276

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111 WEST JACKSON BLVD., CHICAGO, ILLINOIS 60604, TEL. 312-663-9415
International Specialists in the Environment

2. SITE BACKGROUND

2.1 SITE DESCRIPTION

The DCP area is located in and around the cities of Sauget (formerly Monsanto) and Cahokia in west-central St. Clair County, Illinois (see Figure 2-1). The project area consists of 12 suspected uncontrolled hazardous waste sites, and six segments of Dead Creek, which is an intermittent stream flowing southerly in the eastern portion of the project area. To avoid confusion stemming from various file designations or aliases for the various sites or creek sectors, each site or creek sector has been assigned an alphabetical designation (see Figure 2-2). The disposal sites occupy approximately 220 acres.

The scope of work revision submitted to IEPA in August 1986 included the concept of grouping several sites and creek sectors together for future Hazard Ranking System (HRS) scoring purposes. Sites were grouped into areas based on geographical relationship, same ownership or similar operation, and similar waste types and common exposure pathways. Sites grouped into areas included Sites G, H, I, L, and Creek Sectors A and B (Area 1), and Sites O, Q, and R (Area 2). These areas are presented in Figure 2-3. Sites J, K, M, N, and P do not meet requirements for site aggregation and will be referred to henceforth as peripheral sites.

The DCP sites consist of a number of former municipal and industrial waste landfills; surface impoundments or lagoons; surface disposal areas; past excavations thought to be filled or partially filled with unknown wastes; and an areal drainage flowpath (Dead Creek).

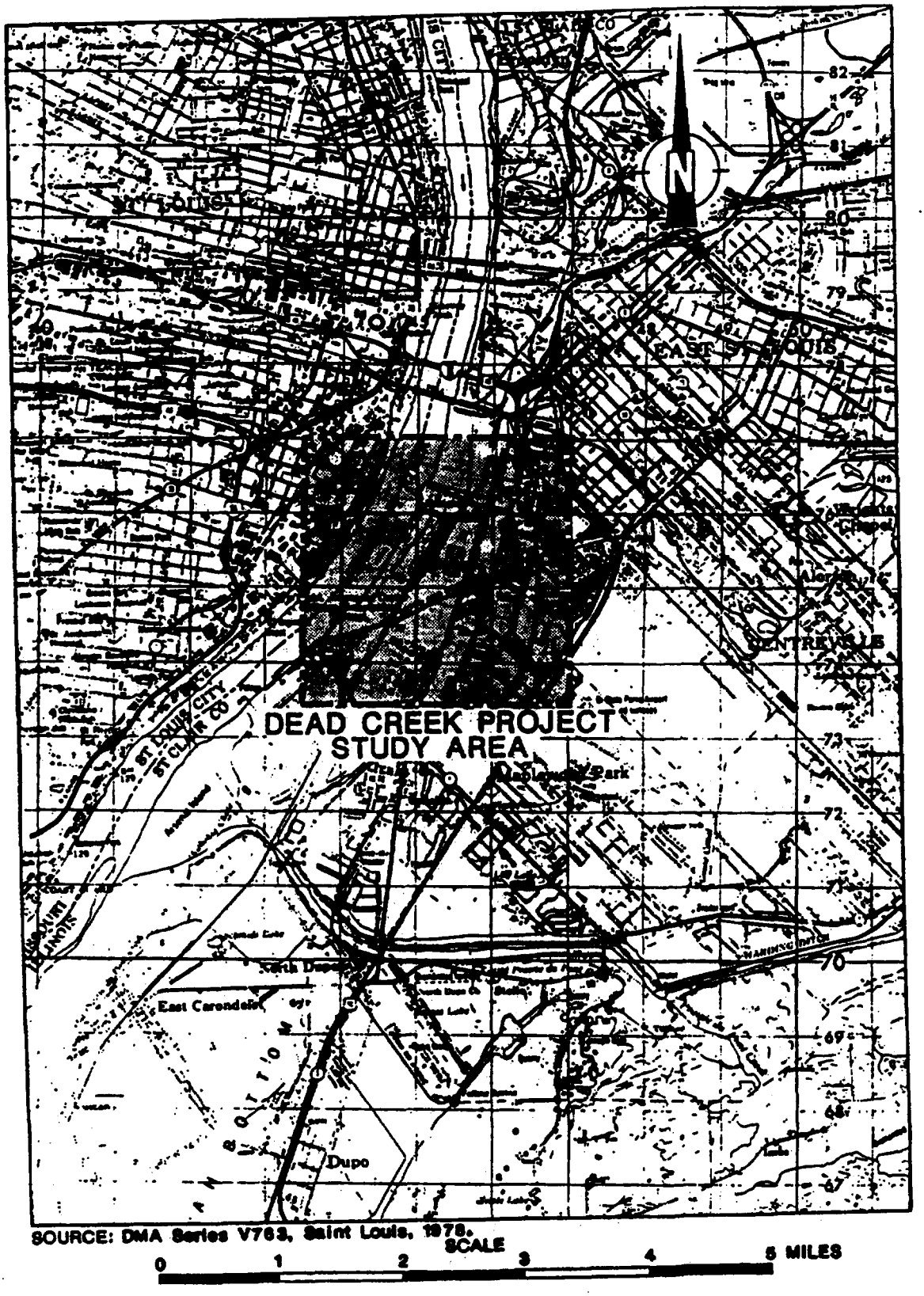


FIGURE 2-1 DEAD CREEK PROJECT STUDY AREA LOCATION

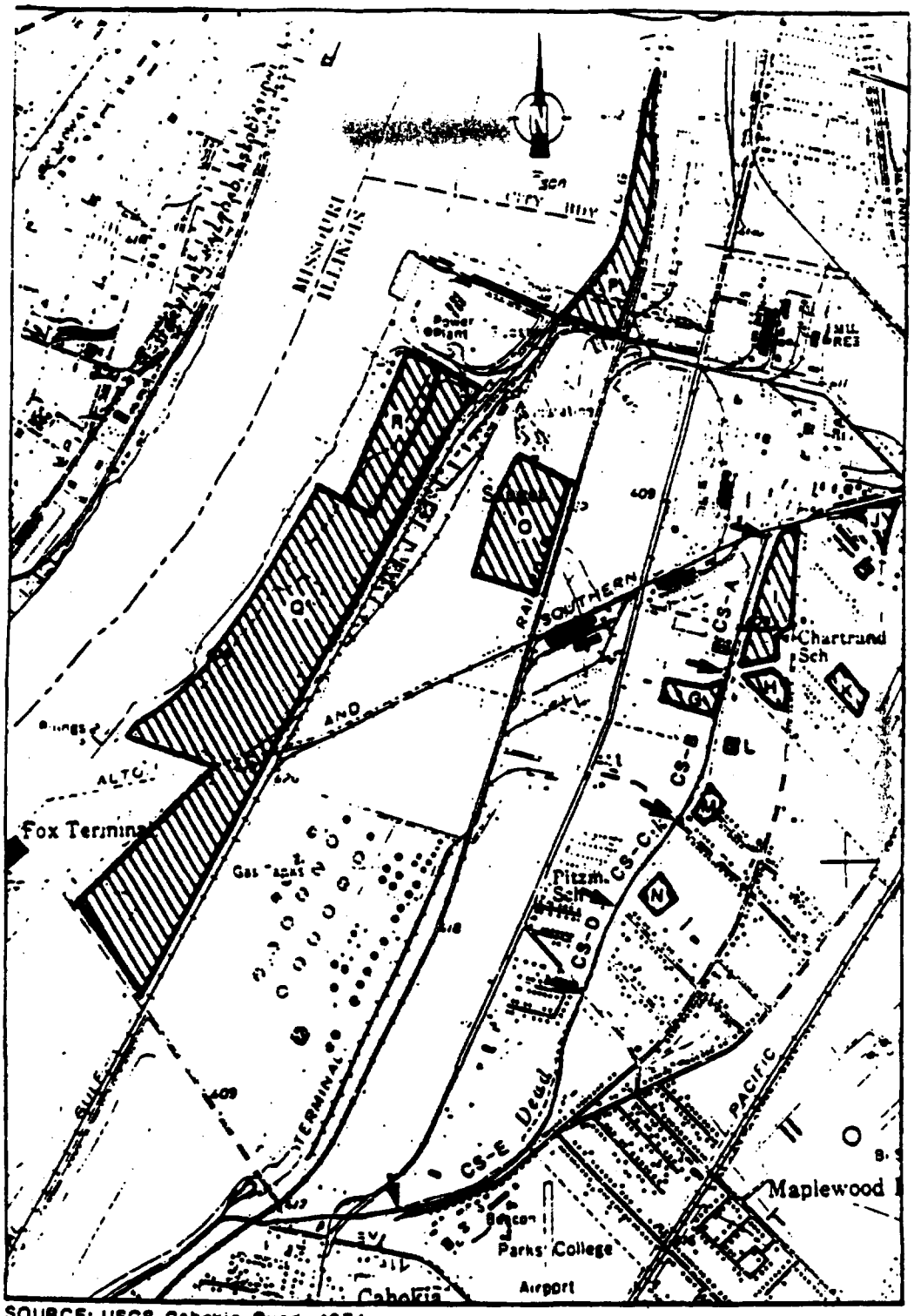
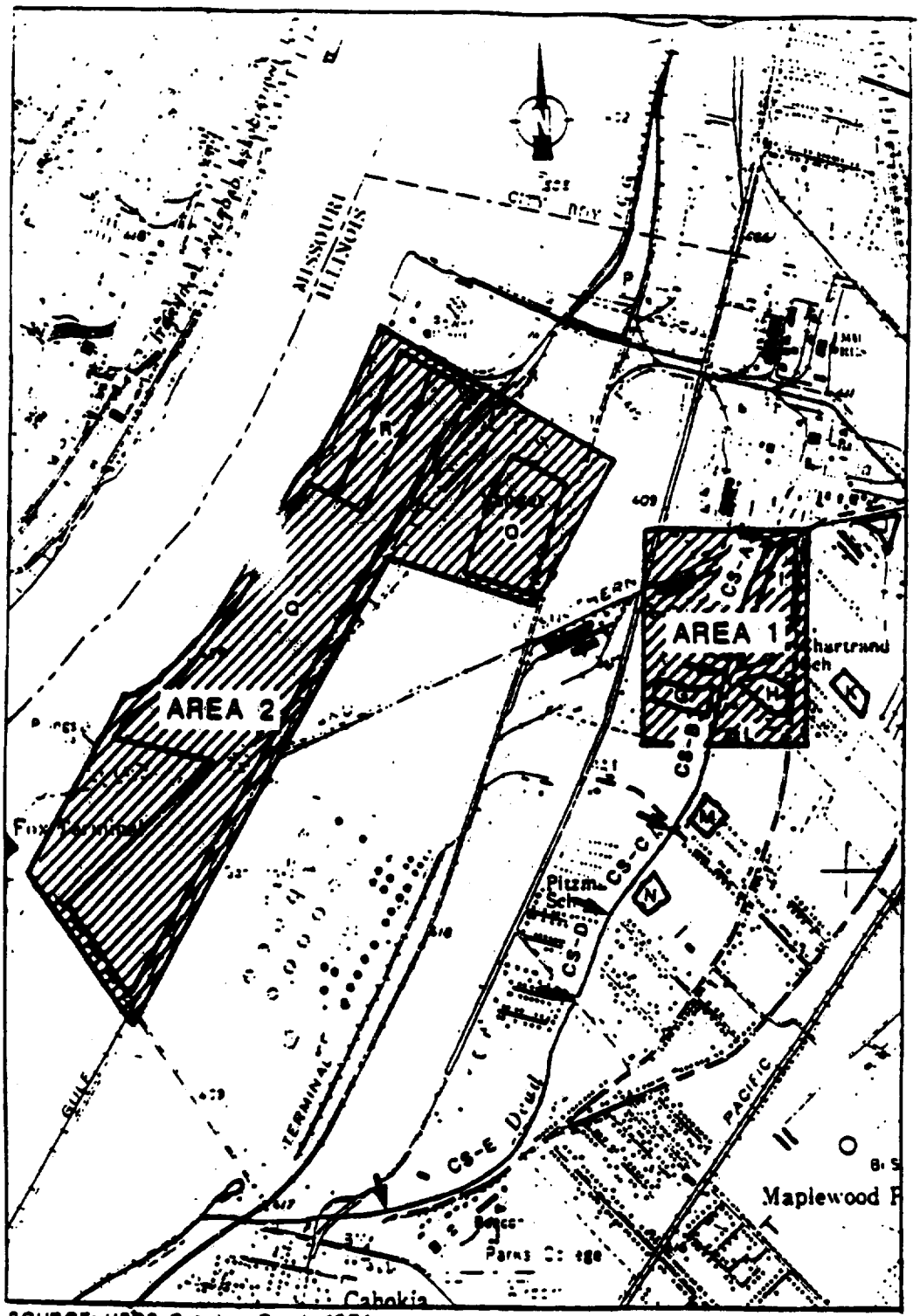


FIGURE 2-2 SITE REPORTING DESIGNATIONS FOR THE DEAD CREEK PROJECT



SOURCE: USGS Cahokia Quad. 1974.

FIGURE 2-3 SITE GROUPINGS FOR THE DCP UNDER THE REVISED SCOPE OF WORK

The following is a brief description of the individual sites and Dead Creek:

Area 1 Sites

Site features for Area 1 sites and creek sectors are shown in Figure 2-4.

Site G. Site G is a former subsurface/surface disposal area which occupies approximately 4.5 acres. The site is located in Sauget and is bordered on the north by Queeny Avenue, on the east by Dead Creek, on the south by a cultivated field, and on the west by Wiese Engineering Company property.

The surface of Site G is littered with demolition debris and metal wastes. Two small pits are located in the northeast and east-central portions of the site. Oily and tar-like wastes, along with scattered corroded drums, are found in these areas. Additionally, 20 to 30 deteriorated drums are scattered along a ridge running east-west, near the southern perimeter of the site. The western portion of Site G contains a mounded area with several corroded drums protruding from the surface. A large depression is found immediately south of the mounded area. This depression receives surface runoff from a sizable area within the site. Exposed debris is also present over most of the site. In areas where wastes are not exposed, fly ash and cinder material has been used as cover. Presently, a chain-link fence surrounds Site G. The fence was constructed in May 1987 as a response action after high levels of organic contamination were detected in surficial soils.

Site H. Site H is a former subsurface disposal area covering approximately 5 acres. The site is located in Sauget immediately southwest of the intersection of Queeny Avenue and Falling Springs Road. The surface of Site H is an open field which has been covered, graded, and vegetated. Several depression areas, capable of retaining rainwater, are also evident across the site. Surface drainage is generally to the west; although certain localized drainage is toward the depressions. Waste material is not evident on the surface of the site. Access to Site H is not controlled.

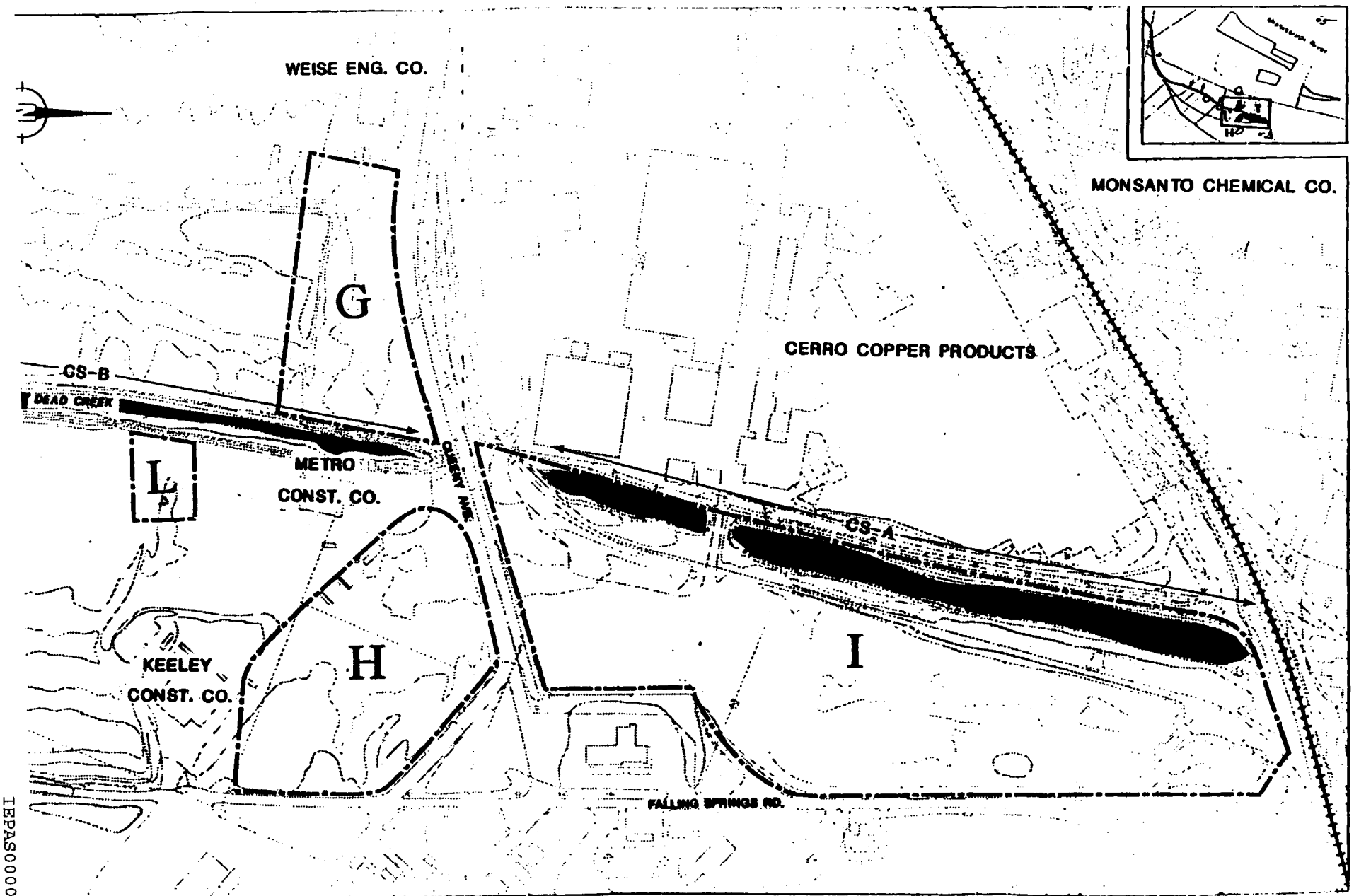


FIGURE 2-4 SITE FEATURES MAP, AREA 1

Site I. Site I, in Sauget, consists of approximately the eastern one-third of the Cerro Copper Products (Cerro) property. Cerro is a copper refining and tube manufacturing facility. Site I is approximately 55 acres in area and is a former sand and gravel pit which was subsequently filled with unknown wastes. Two holding ponds (Creek Sector A) which formerly served as headwaters for Dead Creek are located along the west side of Site I. The former gravel pit/fill area was covered and graded, and is presently used for equipment and scrap storage and truck trailer parking. No waste material or drums are evident on the surface of Site I. Access to the entire Cerro property is controlled by a chain-link fence and a 24-hour guard at the main entrance to the facility.

Site L. Site L is the former location of a surface impoundment used by a hazardous and special waste hauler to dispose of wash water from truck cleaning operations. The dimensions of the impoundment are approximately 70 feet by 150 feet. The impoundment was approximately 250 feet south of the present Metro Construction Equipment Company (Metro) building, and approximately 125 feet east of Dead Creek in Cahokia. The site is now covered with black cinders, and is used by Metro for equipment storage. Several rows of heavy construction equipment are presently stored on the site. No waste material is visible on the surface of Site L. Access to the area is not controlled.

Dead Creek Sectors A and B. Creek Sector A (CS-A) is on Cerro property in Sauget and is located immediately west of the former sand pit which constitutes Site I of the DCP. The creek in this area presently consists of two holding ponds which receive surface runoff and roof drainage from Cerro. According to Cerro officials, no process wastewater, cooling water, or other waste is discharged to the ponds. The water in CS-A is highly discolored and oily, as evidenced by staining along the creek banks. A culvert located at the south end of CS-A that extends under Queeny Avenue was blocked some time in the early 1970s to prevent flow to the remainder of the creek. Since CS-A lies entirely on Cerro property, access is as described above for Site I.

Creek Sector B (CS-B) is the portion of Dead Creek lying between Queeny Avenue and Judith Lane in Sauget and Cahokia. Three other sites in the DCP study area are located adjacent to CS-B, namely, Site G to the northvest, Site L to the northeast, and Site M to the southeast. All of these sites have been identified at one time or another as possible sources of pollution in CS-B. Presently, CS-B and Site M are encompassed by a chain-link fence which vas installed by the USEPA in 1982. The banks of the creek are heavily vegetated, and debris is scattered throughout the northern one-half of CS-B. Culverts at Queeny Avenue and Judith Lane have been blocked, preventing any release of contaminants to the remainder of the creek. Water levels in the creek vary substantially, depending on rainfall, and during extended periods of lov precipitation, the creek becomes a dry ditch.

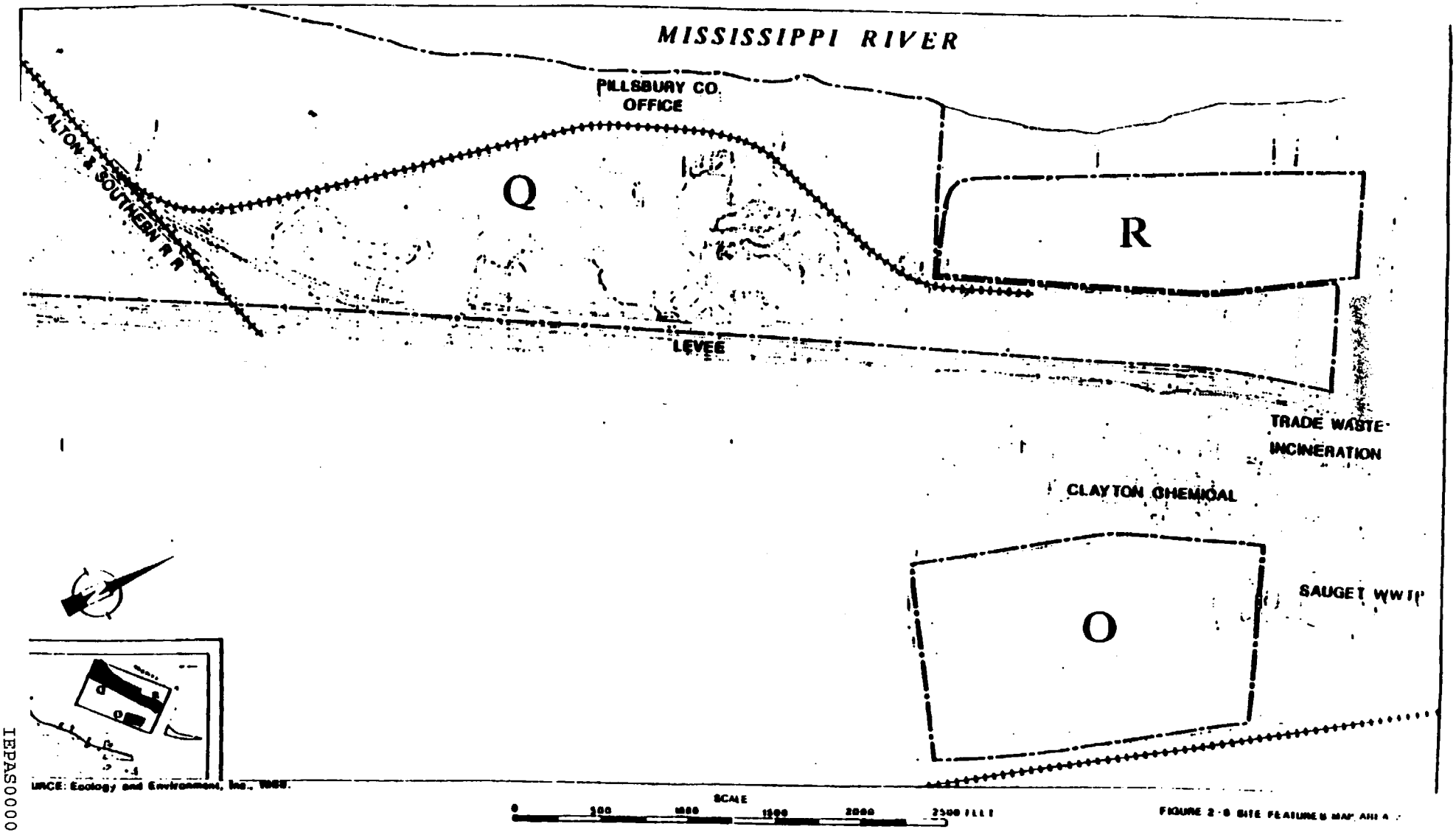
Area 2 Sites

Site features for Area 2 sites are shovn in Figure 2-5.

Site O. Site O contains four inactive sludge devatering lagoons associated with the Sauget Vaste Vater Treatment Plant. The site covers approximately 45 acres in a heavily industrialized area located on Mobile Avenue in Sauget. The former sludge lagoons cover approximately 20 acres to the south of the treatment plant buildings. The former lagoons have been covered. An access road to the nev American Bottoms Treatment Plant, located immediately southvest of the former lagoons, runs through the middle of the site. Although chain-link fencing surrounds most of the site, vehicular traffic on the access road is not restricted.

Two active industrial facilities, Clayton Chemical Company and Trade Vaste Incineration, are located adjacent to the vest boundary of Site O. Clayton Chemical is a solvent recovery facility, and Trade Vaste provides vaste destruction services to area and other industries.

In addition to these facilities, a small area in the northern portion of Clayton Chemical property vas formerly occupied by storage tanks ovned by Bliss Vaste Oil Company. These tanks vere allegedly used to store vaste oils and chemicals containing 2,3,7,8-tetrachlorinated dibenzo-p-dioxin (TCDD). One leaking underground storage tank vas



URCE: Ecology and Environment, Inc., 1988.

FIGURE 2-6 SITE FEATURES MAP, AREA

removed from this area, and contaminated soil was excavated and disposed of off-site. A separate area of contamination was identified at Site O in 1983. A coordinated sampling effort between IEPA and Envirodyne Engineers revealed high concentrations of TCDD and polychlorinated biphenyls (PCBs) in surficial soils in an area northwest of the former sludge lagoons. Contaminated soil and gravel was removed from the area, and is currently stored in an enclosed area on the treatment plant property.

Site Q. Site Q is an inactive waste disposal facility in Sauget and Cahokia, formerly operated by Sauget and Company. The site covers approximately 90 acres and is located on the east bank of the Mississippi River, on the river side of a United States Army Corps of Engineers (COE) flood control levee. The northern one-third of Site Q is situated immediately east of Site R. The majority of Site Q is presently occupied by the Pillsbury Company, which operates a coal and grain unloading and transfer facility on the property. Large mounds of coal and cinders are present in the northern one-half of the property. The southern portion of the site is presently unoccupied. Some random dumping of household-type waste is evident in this area. A railroad spur divides the site, running north from the Alton and Southern Railroad tracks to the northern one-third of the property, where it ends. Several ponds, including two in the east-central portion and two in the area south of the Alton and Southern Railroad tracks, also exist on the site. Vehicular access to Site Q is presently restricted by fencing in the northern portion of the site and by a 24-hour guard at the main gate. Pedestrian access to the site, however, is unrestricted in the southern portion of the site.

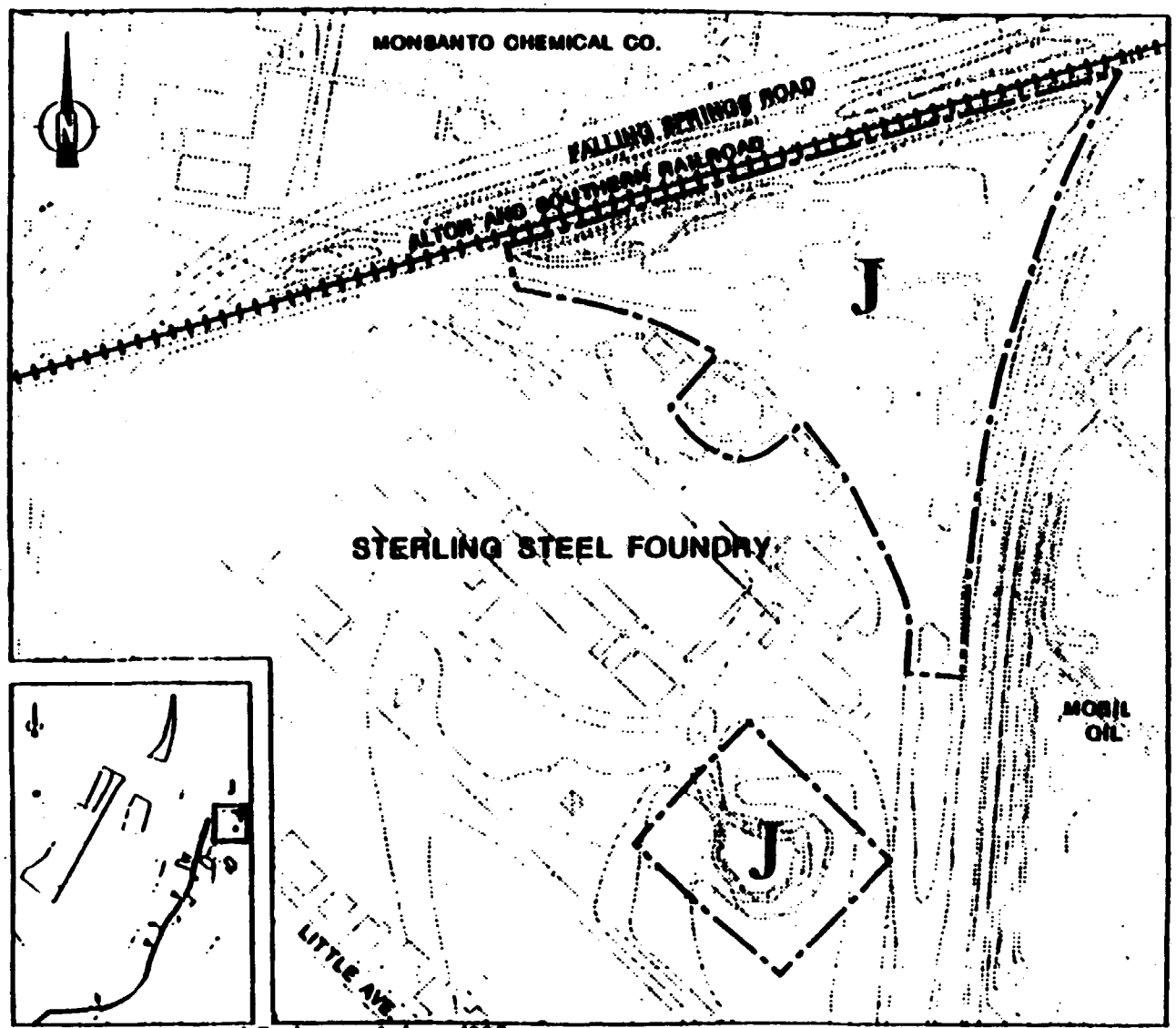
Site R. Site R, in Sauget, is the Sauget Toxic Dump (also known as the Krumwich Landfill), an inactive industrial waste landfill owned by the Monsanto Chemical Company (Monsanto) and used by Monsanto as a landfill between 1957 and 1977. Site R occupies approximately 36 acres and is located immediately west and north of Site Q. A Monsanto feedstock tank farm is located adjacent to the site on the northwest side, between the west border of Site R and the Mississippi. The site

is presently covered with a well-vegetated clay cap. Surface drainage flows to ditches around the perimeter of the site. The riverbank adjacent to the site is covered with rip-rap consisting of large rocks and boulders. This site has a long history of leachate flow into the Mississippi River. Access to Site R is restricted by a chain-link fence, and television cameras are used to monitor activity at the main gate. A second gate provides access through Site Q.

Peripheral Sites

Site J. Site J is in two segments on the Sterling Steel Foundry Property in Sauget in the eastern part of the DCP. It consists of two pits and a surface disposal area presently utilized by Sterling (see Figure 2-6). The surface disposal area, occupies approximately 5 acres in a roughly triangular area northeast of the plant buildings, south of the Alton and Southern Railroad, and west of a bermed area. Casting sand, slag, and miscellaneous debris covers this entire area. A small pit contiguous to the triangular area, north of the main foundry building has been partially filled with casting sand and baghouse dust. No evidence of chemical waste disposal is apparent in this area. A larger pit is situated southeast of the plant buildings. This pit has been partially filled with casting sand and miscellaneous debris. The larger pit is approximately 25 feet deep, and there is water at the bottom of it. The entire Sterling property is bordered by a chain-link fence; however, the entrance gate is not locked or guarded.

Site K. Site K is a former sand pit identified through historical aerial photographs. The pit has been filled with unknown materials and covered with soil and gravel. The area has been graded to the surrounding topography. The site is presently unoccupied, covers 6 acres, and is located in Sauget north of a residential area on Queeny Avenue, and east of Falling Springs Road (see Figure 2-7). Several trailer homes and houses are located within 100 feet of the site. Access to Site K is not restricted.

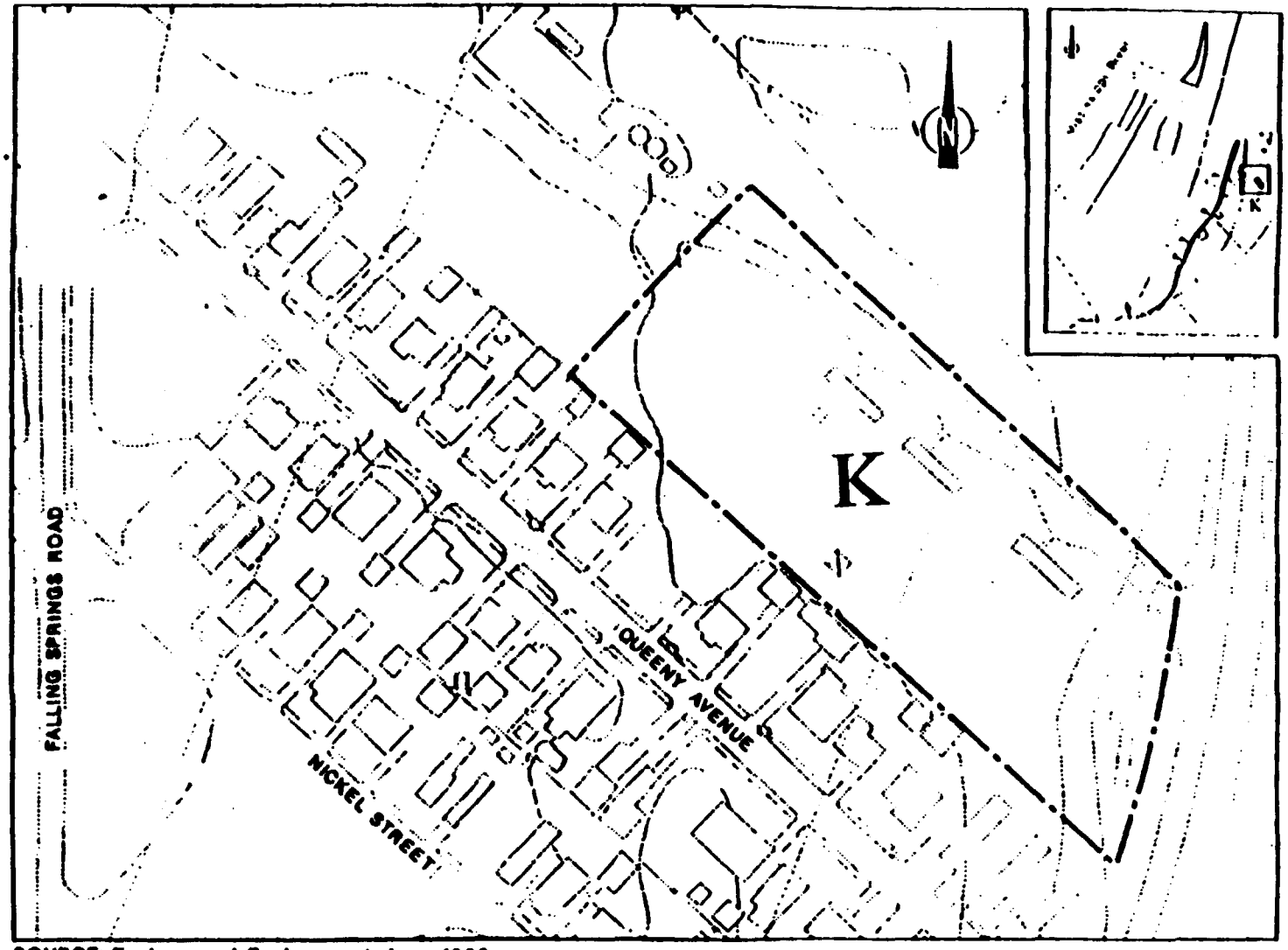


SOURCE: Ecology and Environment, Inc., 1988.

SCALE

0 200 400 600 800 1000 FEET

FIGURE 2-6 SITE FEATURES MAP, SITE J



SOURCE: Ecology and Environment, Inc., 1988.

FIGURE 2-7 SITE FEATURES MAP, SITE K

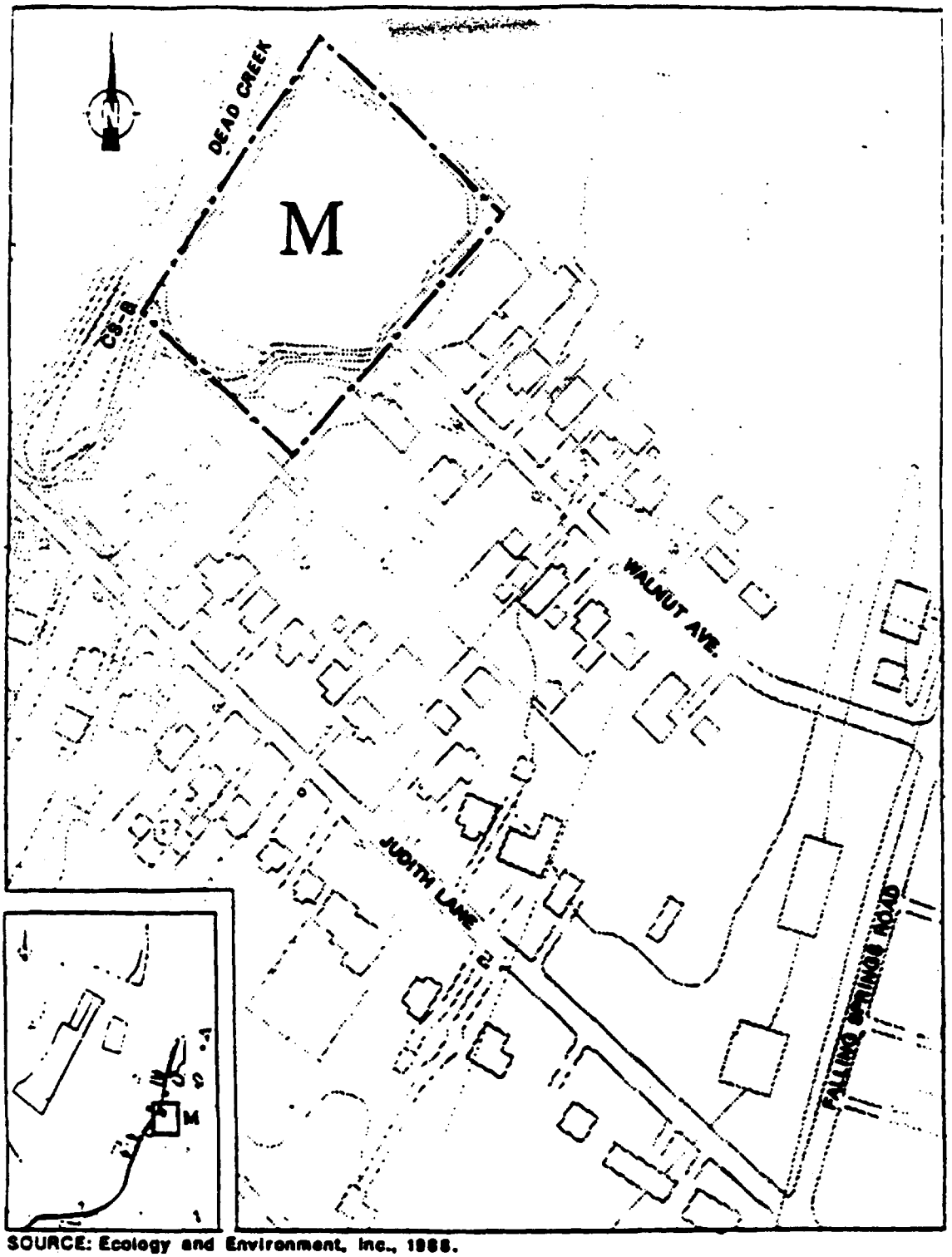
Site M. Site M, in Cahokia, is a former sand pit excavated by the H.H. Hall Construction Company in the mid- to late-1940s. It is located immediately east of Dead Creek, and approximately 300 feet north of Judith Lane (see Figure 2-8). The dimensions of the pit are approximately 275 by 350 feet, and the estimated depth is 40 feet. The pit is presently filled with water, although it remains unclear whether the water is a surface expression of the groundwater, or simply collected rainwater and drainage. Site M is connected to CS-B of Dead Creek by a drainageway, or cut-through, located in the southwest corner of the pit. This cut-through is approximately 8 feet wide, and allows flow between the creek and the pit. The east bank of the pit is strewn with miscellaneous trash and debris. Other than this material, no evidence of waste disposal is apparent in the pit.

Presently, Site M is enclosed by a chain-link fence, which also encompasses CS-B. A small residential area is located just east of the pit on Walnut Street, which earlier served as an access road to Site M. The pit was excavated prior to any residential development on this street.

Site N. Site N is an excavated area in the southwest corner of an inactive construction yard owned by the H.H. Hall Construction Company of East St. Louis (see Figure 2-9). The site is 4 acres in area and is bordered on the northwest by Dead Creek. The excavated area has been partially filled with construction and demolition debris, but the area remains below the surrounding topography.

The Hall property is presently used only for equipment storage. Access to the Hall property is restricted by a chain-link fence with a padlocked gate.

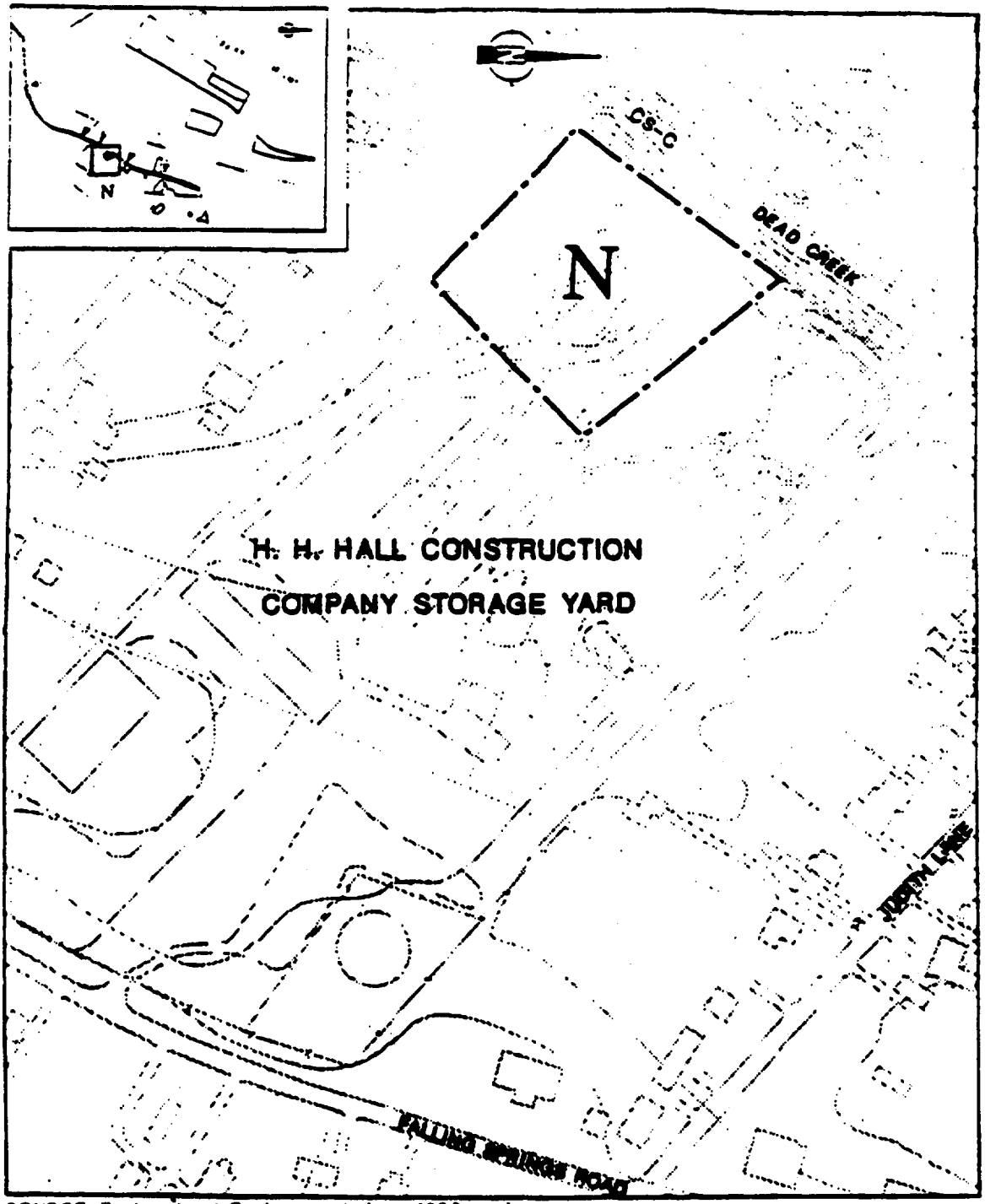
Site P. Site P is an inactive, IEPA-permitted landfill operated by Sauget and Company covering approximately 20 acres in the northern part of the DCP in Sauget (see Figure 2-10). The site is bordered on the west by Illinois Central Gulf Railroad tracks; on the south by Monsanto Avenue; and on the east by the Terminal Railroad Association railroad tracks. The two railroads converge at the north end of the site.



SOURCE: Ecology and Environment, Inc., 1988.

SCALE
0 100 200 300 400 500 FEET

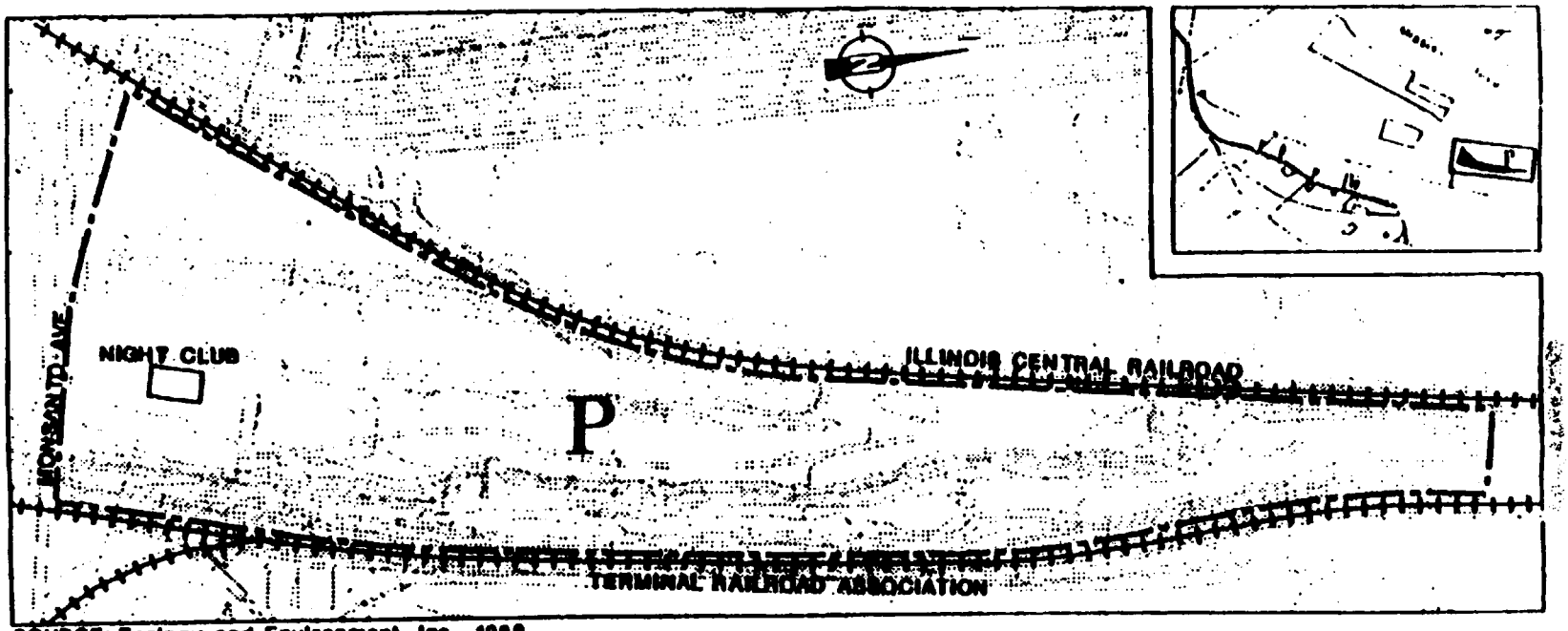
FIGURE 2-8 SITE FEATURES MAP, SITE M



SOURCE: Ecology and Environment, Inc., 1988.

SCALE
0 100 200 300 400 500 FEET

FIGURE 2-9 SITE FEATURES MAP, SITE N



SOURCE: Ecology and Environment, Inc., 1988.

SCALE
0 200 400 600 800 1000 FEET

FIGURE 2-10 SITE FEATURES MAP, SITE P

Site P is characterized by steep sloping landfill sides along its east and south-central portions. The majority of the site is covered with cinders. Deep erosional channels are prevalent along the slopes. The south-central portion of the site was not landfilled because of the presence of a potable water line in this area. A nightclub and asphalt-covered parking lot presently occupy approximately 3 acres in the southeast corner of the site. Access to the site is not restricted.

Dead Creek Sectors C through F. Creek Sectors C through F include the entire length of Dead Creek south of Judith Lane. This portion of the creek flows south-southwest through the Village of Cahokia prior to discharging into the Prairie DuPont Floodway (see Figure 2-11). The floodway subsequently discharges into the Cahokia Chute of the Mississippi River. The creek is wider in these sectors than in Sectors A and B, and the banks are not as heavily vegetated as along CS-B. In the southern portion of CS-D, near Parks College, the creek runs underground through a corrugated pipe. The creek resurfaces briefly at the intersection of Illinois Route 157 and Falling Springs Road. Downstream of this point, the creek runs west through a series of culverts prior to draining into a wetland area west of Illinois Route 3.

Creek Sectors C through F are delineated as follows: CS-C, Judith Lane to Cahokia Street; CS-D, Cahokia Street to Jerome Street; CS-E, Jerome Street to the intersection of Illinois Routes 3 and 157; and CS-F, from this intersection to the discharge point in Old Prairie DuPont Creek. Access to Creek Sectors C through F is unrestricted, and children have been observed playing in and around the creek on several occasions.

2.2 SITE GEOGRAPHY

2.2.1 Physiography

2.2.1.1 Area Topography

The DCP study area is situated in the far southwest portion of the Springfield Plain within the Till Plains Section of the Central Lowland Province (Leighton et al. 1948) of Illinois (see Figure 2-12). The Springfield Plain is basically a flat till plain consisting of Illinoian drift. The western boundary of the till plain is marked by morainic and

3.7.2 Well Evacuation

Prior to collecting groundwater samples, the static water level in each monitoring well was measured to determine the volume of water in each well. After calculating the volume of water stored in each casing, wells were purged using stainless steel bailers. A minimum of three well volumes was purged from each monitoring well. Samples were collected immediately after purging at each well.

Residential wells were purged by allowing outside taps to flow for approximately 5 minutes prior to sample collection. The well sampled with the Masterflex pump was also purged for approximately 5 minutes. Because the well at Clayton Chemical is pumped on a regular basis, the tap was allowed to flow for approximately 3 minutes in order to acclimate the tap line plumbing.

3.7.3 Decontamination

Stainless steel bailers purchased for the groundwater sampling were thoroughly cleaned off-site prior to use to remove any contamination resulting from the manufacturing process. Bailers were cleaned using the decontamination procedure described in Section 3.4 of this report. The procedure includes scrubbing in a trisodium phosphate solution, a triple solvent rinse, and two deionized water rinses. After cleaning and drying, bailers were wrapped in aluminum foil for transport to the field, and kept wrapped until their use. Replacement samples were collected using the same bailers as used initially for each well. The same decontamination procedure was used prior to collecting the replacement samples.

3.7.4 Sample Filtering and Preservation

Groundwater samples collected for metals analysis were filtered in the field prior to submittal to the laboratory. The filtering procedure consisted of using a Masterflex pump to draw a sample into a filter assembly containing Teflon screens and a 0.45-micron filter. Samples were pumped through this assembly into clean 1-liter plastic sample bottles. After filtering, samples were preserved with nitric acid and iced in the shipping container.

Whenever possible, visually clean samples and blanks were filtered before oily or dirty samples. Between samples, deionized water was run through the filter assembly and tubing in order to avoid cross-contamination. If exceptionally dirty or oily samples were encountered, filter tubing was replaced prior to filtering another sample.

As stated above, samples analyzed for metals were preserved with nitric acid. Samples submitted for cyanide analysis were preserved with sodium hydroxide. All samples analyzed for organic parameters were cooled with ice prior to shipment, as were the samples for metals and cyanide analysis. Sample bottles were labeled and placed in plastic bags to avoid contamination from the vermiculite used as packing material. Custody seals were placed on the lids of each sample bottle and on the lids of the ice chests used for shipment.

QA/QC for the sampling were governed by the project QAPP. Chain-of-custody and record-keeping procedures as described in the QAPP were also followed.

The analytical results for groundwater samples are presented and discussed in Section 4.2.5 of this report.

3.8 AIR SAMPLING

Air sampling was conducted at two DCP aggregate site areas (Area 1 and Area 2) in order to increase the possibility of qualifying sites for inclusion on the USEPA NPL. Sampling procedures, QA/QC, and subsequent chemical analysis were governed by an addendum to the project QAPP, submitted to IEPA in March 1987. Air samples were collected during the weeks of July 13 and July 20, 1987.

3.8.1 Monitoring Strategy and Design

Previous investigations in the DCP area had indicated the presence of a wide variety of contaminants in several media. For this reason, an air sampling strategy was developed to address a wide range of chemicals rather than focusing on a single class, or group, of compounds. The sampling program was also designed to address both volatilization of contaminants and contaminants bound to airborne particulates. USEPA QC requirements for scoring an air release using the HRS model are very stringent. A detailed sampling approach, resulting in quantified data,

Exhibit 4

Sauget, Illinois

Address: W.G. Krummich
500 Monsanto Avenue
Sauget, IL 62206-1198

Telephone: (618) 271-5835

Fax: (618) 482-6520

Site Manager: Robin Prokop

Key Products:

- World's largest integrated chlorobenzenes manufacturer (*monochlorobenzene, ortho- and para-dichlorobenzene, ortho- and para-nitrochlorobenzene, ortho- and para-nitroaniline*). These compounds are used in a wide variety of products:
  - Polymers and Polymer additives
  - Pharmaceuticals (analgesics and veterinary)
  - Agricultural chemicals
  - Air fresheners/moth repellents
  - Dyes/pigments
  - Rubber chemical antioxidants
  - Water treatment chemicals
  - Solvents
- Muriatic Acid used in metal pickling, food, chemical and a variety of cleaning applications.
- Phosphorus Pentasulfide (oil additive and ag chemicals intermediate) manufactured for Astaris.
- Santoflexes (antioxidant rubber chemicals intermediates) manufactured for Flexsys.. ACL (swimming pool and water treatment chemical) manufactured for Oxychem.

Site Information: The William G. Krummrich Plant was the second plant operated under the Monsanto name. In 1917, Monsanto purchased the plant from Commercial Acid Company. Growth accelerated in the '50s and '60s with new units for producing chlorobenzenes and other products, a nitration facility and a modernized phenol plant. In 1952 the plant was renamed the W. G. Krummrich Plant in honor of a previous plant manager. The Krummrich Plant currently manufactures chemical intermediate products for Solutia, Astaris (joint venture between Solutia and FMC), Flexsys (joint venture between Solutia and Akzo-Noble) and OxyChem.

Notable Accomplishments:

- Certification through OSHA Star Voluntary Protection Program (VPP).
- First Monsanto location worldwide to receive site-wide ISO-9002 registration of its quality systems.
- Access to world-class utilities and industrial waste treatment facilities.
- Introduction of novel technology in the manufacture of dichlorobenzenes.
- Numerous customer recognitions, including Michelin Certified Supplier and Ciba Specialty Chemicals Supplier of Choice, Goodyear Class 1 Preferred Supplier, Chevron Oronite Preferred Supplier, Eastman Supplier Excellence Award, and UOP Preferred Supplier.

TRIP REPORT

for:

SAUGET AREA 2
SAUGET, ILLINOIS

ILD 000605790

PREPARED BY:
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
BUREAU OF LAND
FEDERAL SITE REMEDIATION SECTION
SITE ASSESSMENT UNIT

MARCH 2000

TRIP REPORT FOR SAUGET AREA 2

On May 24 - 27, 1999 the Illinois Environmental Protection Agency (Illinois EPA) conducted an Expanded Site Inspection of the Sauget Area 2 sites located in the Village of Sauget, Illinois in St. Clair County (Figure 1). The sites are designated: Site O, Site P, Site Q, Site R, and Site S. Sampling activities were conducted at these locations (Figure 2) to investigate potential groundwater and soil contamination from waste disposal activities related to the manufacture of chemicals by Monsanto/Solutia-W. G. Krummrich Plant. Representing the Illinois EPA were Brad Taylor, Bruce Everetts, Mark Weber, Ted Prescott, Ann Cross, and Ken Corkill from the Site Assessment Unit and Tom Miller and Gina Search from the Illinois EPA's Collinsville Field Operations Section (FOS).

The W. G. Krummrich Plant is the chemical manufacturing facility of Solutia Incorporated located in Sauget, Illinois. The Area 2 sites collectively cover an area of approximately 312 acres. The individual site acreage is as follows: Site O (22.48 acres), Site P (28.6 acres), Site Q (225.1 acres), Site R (24.75), and Site S (10.76 acres). Please refer to Attachment 1 for area measurements. Sites Q and R are located adjacent to the Mississippi River and west of the Corp. of Engineers 500-year flood control levee. Sites O, P, and S are located east of the flood control levee. For specific site borders and locations relative to the other Area 2 sites and the main manufacturing plant (W.G.Krummrich Plant) please refer to Figure 2.

The W. G. Krummrich facility was acquired by Monsanto Chemical Co. as an operating facility in 1917. This facility was formerly known as the Commercial Acid Company which manufactured sulfuric acid, zinc chloride, chlorosulfonic acid and sodium sulfate. Over the course of operations at the facility, Monsanto has manufactured a wide variety of chemicals, both organic and inorganic. According to a 1992 Resource Conservation and Recovery Act (RCRA) Facility Assessment Report, the following products and wastes have been or are presently generated: spent halogenated and non-halogenated solvents, mercury contaminated wastes, chlorobenzenes, nitrochlorobenzene and benzene compounds, phenols, phosphorus, polychlorinated biphenyl (PCB) compounds, dioxin, aromatic nitro compounds, amines and nitroamines, agent orange, maleic anhydride, acids and caustics. Industrial wastes generated at the W. G. Krummrich facility throughout its operational history have been disposed within its property boundaries (Lots B, C and F) and in various landfill areas within the Village of Sauget. Such disposal areas have been identified through investigation and environmental sample collection over a period of approximately thirty years. Five of these locations have been grouped into what is referred to as Sauget Area 2 (Sites O, P, Q, R, and S). Analysis of environmental samples collected from each Area 2 site reveal chemicals similar to those previously or currently produced by the W. G. Krummrich Plant. Refer to Figure 3 for sample locations.

Site O consists of four, unlined, former settling lagoons used by the old Village of Sauget Wastewater Treatment Plant to dewater sludge generated from treatment of wastewater originating from the Village of Sauget. Ninety-five percent of the wastewater was generated by

local industries. Monsanto contributed approximately eighty percent of the industrial volume. Site O is located west of the W.G. Krummrich Plant and east of Sites Q and R. Site O is approximately 22.5 acres in size and was in operation from 1966 to 1978. The sludge beds (settling lagoons), as constructed, were excavated into the Henry Formation sand. They were closed and covered in 1978. A 1988 Ecology and Environment (E & E) report states that soil borings indicated much of the sludge may have been removed prior to closure. However, some sludge or sludge neutralized with lime was found in a number of soil borings drilled within the lagoons. Staining of sand deposits was also observed beneath the sludge material. The lagoons were found to be covered with a silty clay cap ranging in thickness from one to seven feet. Vegetation in the form of grass, bushes and trees has subsequently been established on the cover material. Chemical analysis of soil and groundwater samples collected from Site O during previous sample events revealed contaminant concentrations exceeding regulatory soil benchmarks and groundwater quality standards. Analysis of samples collected during the May 1999 IEPA environmental investigation indicate volatile, and semi-volatile contaminants in soil and groundwater with a dioxin analyte also within the groundwater. Contaminants present (refer to Sample Summary Tables) correspond to products and wastes generated by Monsanto/Solutia-W.G. Krummrich Plant.

Site P is known as Sauget-Monsanto Landfill. The landfill is located northwest of the W.G. Krummrich Plant, north of the other Sauget Area 2 sites. Information from the 1988 E & E report indicate that based on soil borings fill material consisting of silty clay, cinders, slag and refuse was disposed directly onto the land surface. The soil borings also indicate Site P is unlined, as fine to medium grain sand was found immediately beneath the fill. Groundwater, during the 1988 investigation, was noted to be between 25 and 30 feet below ground surface. Site P is approximately 28.6 acres in size. One existing business, P.T.'s Show Club, is located in the southwest corner of Site P. A 500-year flood control levee protects Site P from direct Mississippi River flood events. In January 1973, IEPA issued an operating permit to Sauget and Company to accept only non-chemical waste from Monsanto Chemical Company, W. G. Krummrich Plant. Permit violations were documented throughout the operation of the landfill, which included discovery of chlorinated industrial wastes from Monsanto. IEPA required the removal of this material from the landfill. It is unclear, however, if Monsanto ever fulfilled this requirement. During a 1991 IEPA inspection of Site P, elevated levels of volatile organic compounds were documented in the landfill and around its perimeter. These constituents also correspond to products and wastes generated by Monsanto. The May 1999 IEPA inspection (refer to Sample Summary Tables) revealed volatile, semi-volatile, pesticide, PCB, inorganic and dioxin analytes contaminating soil. Analysis of groundwater revealed semi-volatile, pesticide, PCB, and inorganic analyte contamination. Groundwater was extracted and sampled from between 24 and 28 feet below ground surface.

Site Q is known as the Sauget and Company Landfill. The landfill is an inactive facility located south of Site R, with the west side of the landfill bordering the Mississippi River and the east side bordering the flood control levee. The landfill is, as Site R, located along the Mississippi River west of the Krummrich Plant and situated on the Mississippi River floodplain which floods

almost yearly. Due to the flood event in spring/summer 1993, a number of drums and wastes were unearthed from this landfill. The drums and wastes became the subject of a CERCLA time critical removal coordinated by USEPA Region 5. The landfill, which was operated by Sauget and Company under contract with Monsanto Chemical Company from approximately 1966 until 1973, is unlined and covers approximately 225 acres. No engineered cap has ever been placed over this landfill. Past investigations indicate that the majority of the site is covered with approximately four feet of cinders and fly ash used as cover material for refuse and other types of fill. Refuse and buried fill were reported to range in thickness from 3 to 28 feet (E & E 1983). Industrial, solid and liquid wastes generated by Monsanto were deposited in and documented to exist in this landfill. Environmental samples collected from Site Q document the presence of contaminants in unearthed drums, groundwater, soil and sediment corresponding to the products and wastes generated by the W. G. Krummrich facility. These contaminants are above regulatory benchmarks. The May 1999 investigation revealed VOC, semi-volatile, pesticide, PCB, inorganic and dioxin contaminants throughout Site Q (refer to Sample Summary Tables).

Site R is known by at least four different names: Sauget Toxic Dump, Krummrich Landfill, Monsanto Landfill, or River's Edge Landfill. The landfill, located along the Mississippi River west of the W.G. Krummrich Plant and situated in the Mississippi River floodplain, is approximately 25 acres in size and unlined. Site R, being situated between the Mississippi River and the flood control levee, constructed in the early 1950's (east of the landfill), is subject to periodic flooding. The landfill was operated by Sauget and Company under contract with Monsanto Chemical Company from approximately 1957 until 1977. Monsanto reportedly disposed of liquid and chemical wastes from the W. G. Krummrich Plant and their J.F. Queeny Plant. Chlorinated compounds, including PCB's, and phenols were part of Monsanto's manufactured products. Wastes subsequently generated from these manufacturing processes are known to have been disposed in Site R. Previously conducted environmental investigations have documented contamination of soil and groundwater within and in the immediate vicinity of Site R. Sediment samples collected along the bank of the Mississippi River, along the west edge of Site R, reveal contaminated sediments which exceed environmental benchmarks. During the May 1999 IEPA environmental investigation no samples were obtained from within the fenced boundaries of Site R. However, soil and groundwater samples were obtained from various locations surrounding Site R (refer to Sample Summary Tables). These samples revealed VOC, semi-volatile, pesticide, PCB, and inorganic contaminants in both media, on both, the east and west sides of Site R. Dioxin analytes were also detected in both groundwater and soil samples collected immediately east of Site R in the dog leg of Site Q

Site S is located approximately 100 feet west-southwest of Site O. This area is approximately 11 acres in size and is currently covered mainly with gravel with a small portion covered by an asphalt parking lot and driveway. Aerial photographs from May 1973 and March 1975 revealed this area was used for drum disposal. Drums can be seen in and around standing water within an excavated pit, in both the 1973 and 1975 photos. Historical information pertaining to what this property was used for has not been found. The contents of the drums disposed in Site S are unknown. Analysis of soil samples collected from Site S during previous environmental

investigations revealed high concentrations of volatile organic compounds, PCB's and heavy metals which correspond to constituents produced or wastes generated by Monsanto. During the May 1999 IEPA environmental investigation samples were obtained from two locations within the fenced boundaries of Site S (refer to Sample Summary Tables). These samples revealed VOC, semi-volatile, pesticide, and inorganic contaminants in groundwater and a few VOC, semi-volatile, pesticide, and dioxin contaminants in low concentrations within the soil.

Sample collection at each Area 2 site was completed through use of the Agencys GeoProbe, direct push equipment. Thirteen soil samples were collected from twelve borings, along with sixteen groundwater samples from sixteen boring locations. Proposed sample G105 was not collected due to the viscosity of the liquid found at depth. Eleven of the sample locations were common to both soil and groundwater. See Figure 3 for sample locations.

All soil and groundwater sampling was conducted in accordance with the IEPA's Quality Assurance Project Plan Standard Operating Procedures for sampling with a GeoProbe. Sampling at the Area 2 sites required the GeoProbe operator to pre-probe a sample location with a pre-probe device to penetrate either a gravel pack (generally averaging two feet thick) or hard surface. Once through the gravel pack or other surface the pre-probe was retracted from the bore hole and removed from the probe rod string. A four foot long Macro-Core sample tube with polyethylene sleeve was attached to the rod string and advanced into the soil to a depth of four feet below surface grade to obtain a soil core. The Macro-Core tube was retracted from the bore hole, the poly sleeve was removed from the Macro-Core tube and then placed on a sheet of plastic. This process was repeated to obtain cores to various depths. The sleeves were sliced open one at a time and monitored with a Toxic Vapor Analyzer (TVA), lithology was noted and any soil staining or anomalies were noted prior to moving to the next core. For this sampling event a soil sample from each boring was collected (except at locations where groundwater only was to be collected) from one area within the length of the boring exhibiting the highest TVA reading or was visibly contaminated. Depths at which samples were collected and general descriptions of each location are presented in Attachment 2. Analysis of the organic, VOC, semi-volatile, pesticide, PCB fractions were analyzed by the Illinois Environmental Protection Agency's organics laboratory located in Springfield Illinois. Analysis of the inorganic fraction was conducted by the IEPA's Inorganics laboratory located in Champaign, Illinois. Dioxin analysis was completed by Prairie Analytical Systems located in Springfield, Illinois. A summary of these analysis can be found in table form at the end of this report.

Groundwater samples, collected from common soil sample bore holes, were collected by inserting either a screen point sampler or millslot screen sampler into the same hole used to obtain the soil sample. Groundwater samples from locations exclusive for groundwater were collected utilizing the above mentioned procedures but no soil sample was collected. Collecting soil cores allowed lithology of the location to be noted. The groundwater sample screens were then, in most instances, driven to twenty feet below surface which was approximately five feet below the water table. If using a screen point sampler, the drive rods were retracted four feet to expose the screen, which allowed sampling of groundwater from sixteen to twenty feet. If using

Groundwater sampling techniques

are samples representative

the millslot sampler, two feet of exposed slot area allowed sampling from eighteen to twenty feet. To purge and then sample, polyethylene, size 6, 1/4" I.D., 3/8" O.D. tubing was inserted through the center of the rod string to depth. A peristaltic pump was used to withdraw water. Samples were collected after clarity improved and criteria for aquifer stabilization was met. Analysis of the groundwater samples was conducted by the same laboratories mentioned above. A summary of these analysis can be found in table form at the end of this report.

Analytical results of the May 24 - 27 sampling activity indicated levels of numerous volatile, and semi-volatile compounds in soil significantly above background (background used is sample X101 from the May 10-13, 1999 Expanded Site Inspection at the W. G. Krummrich Plant in Sauget, Illinois) within all samples except X102, X109, and X110. Pesticides and PCB's were found in concentrations significantly above background in all samples. At least one dioxin analyte was found in samples X103 - X105, X107, X109 - X111, and X113. These samples were collected from locations throughout Area 2. Specific compounds found in concentrations significantly exceeding background levels are: benzene, toluene, chlorobenzene, ethylbenzene, xylene, phenol, 2-chlorophenol, 1,4-dichlorobenzene, 1,2-dichlorobenzene, 4-methylphenol, 1,2,4-trichlorobenzene, 4-chloroaniline, 2,4,6-trichlorophenol, 2-nitroaniline, a number of PAH's, pesticide, aroclor and dioxin analytes.

where are results — which one

Inorganic analysis of the soil samples indicated several analytes significantly exceeded background levels. Specific analytes were antimony, arsenic, barium, cadmium, chromium, copper, lead, mercury, vanadium and zinc. Samples X102 - X105, and X107, X109, X111 - X113 were found to contain one or more of the mentioned analytes significantly exceeding background.

Analytical results of groundwater collected during the May 24 - 27 sampling event indicated levels of benzene, toluene, chlorobenzene, phenol, 2-chlorophenol, 1,4-dichlorobenzene, 1,2-dichlorobenzene, 4-methylphenol, nitrobenzene, 2,4-dichlorophenol, 4-chloroaniline, 2,4,6-trichlorophenol, 4-nitrophenol, 4-nitroaniline, and pentachlorophenol were significantly above background (background used is sample G101 from the May 10-13, 1999 Expanded Site Inspection at the W. G. Krummrich Plant in Sauget, Illinois) within a number of samples. Samples G101, G102, G104, G112, G113, and G116 were found to contain one or more of these compounds. Pesticides and PCB's were found in concentrations significantly above background in all samples except G101, G102, G105, G114, and G115. Dioxin analytes were found in G104 and G112.

Inorganic analysis of the groundwater samples indicated several analytes exceeded background levels. Specific analytes were arsenic, manganese, potassium, selenium, sodium, and cyanide. Samples G101, G102, G104, G110, G112, G116 were found to contain one or more of the mentioned analytes exceeding background.

Results of the May 24 - 27 sample analysis indicate that soil and groundwater at the Area 2 sites are contaminated with chemical constituents similar to constituents of chemicals manufactured

at the W. G. Krummrich Plant.

The Area 2 sites are situated on relatively flat terrain of the Mississippi River flood plain referred to as the American Bottoms. Geology of the area consists of the American Bottoms, containing unconsolidated valley fill deposits composed of Cahokia Alluvium, overlying glacial till material of the Henry Formation. The glacial till is underlain by Mississippian age limestone and dolomite bedrock with minor layers of sandstone and shale interbedded.

The Cahokia Alluvium includes the deposits in the floodplain and channels of rivers and streams throughout the state. Locally the alluvium is approximately 40 feet thick and consists of poorly sorted silt, clay, and silty sand with some interbedded sand and gravel lenses. This material becomes courser with depth. The alluvium deposits unconformably overlie the Henry Formation which is approximately 95 feet thick at the Mississippi River and thins with distance from the river. These valley-train materials are generally medium - course sand and gravel which also increase in grain size with depth.

Previous drilling programs conducted across the Area 2 sites have determined that the Alluvium consists of fine gray and brown sand up to 40 feet below land surface. Unconsolidated deposits range from 140 feet thick near the river to 110 feet thick at the eastern edge of the Monsanto/Solutia property. The direction of groundwater flow in the American Bottoms area varies, reflecting changes of river stages. During normal stages groundwater flows toward the river. During high water or flood stages groundwater flows away from the river.

Area residents and businesses obtain their drinking water from the Illinois American Water System which utilizes an intake in the Mississippi River approximately five miles upstream of Sauget. There are, however, a few individuals in the area near Sauget still using ground water wells. In what capacity is not known.

Figures, Tables & Attachments

Exhibit 6

HAZARDOUS SITE CONTROL DIVISION

Remedial Planning/ Field Investigation Team (REM/FIT)

ZONE II

CONTRACT NO. 68-01-6692

CH2M HILL
Ecology & Environment

SOIL SAMPLE RESULTS FOR
CHEMICAL CONTAMINATION BELOW
SAUGET/SAUGET LANDFILL
IN SAUGET, ILLINOIS

TDD R5-8302-5

DATE: DECEMBER 16, 1983

PREPARED BY: RON ST. JOHN

SUBMITTED TO: MIKE O'TOOLE

SOIL SAMPLE RESULTS FOR CHEMICAL CONTAMINATION BELOW SAUGET/SAUGET LANDFILL IN SAUGET, ILLINOIS

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INTRODUCTION

Problem

In the spring of 1980, workers unearthed buried drums and noxious odors while constructing a railway spur across a former municipal landfill called Sauget/Sauget Landfill (S/SL) in Sauget, Illinois. Since noxious odors and labels on the uncovered drums indicated that the substances might be toxic, environmental officials at both the state and federal levels were notified. It was determined that further investigation should be conducted to determine just how serious a problem actually existed. At this point, Ecology and Environment, Inc.'s (E&E) Field Investigative Team (FIT) was assigned the responsibility of assessing and performing any work that would define the level of contamination emanating from past disposal at S/SL.

Purpose

The objective of FIT work at S/SL was to safely and accurately perform a drilling and sampling program of soils below the landfill for the determination of chemical contamination. This included the use of remote sensing techniques to first locate areas where buried drums might exist.

History

The portion of S/SL, which this investigation is concerned with, operated from 1959 (its beginning) to approximately 1966, Figure 1. During this period, Paul Sauget of Sauget and Company (a Delaware corporation) operated it as a municipal landfill. Simultaneously and directly adjacent to S/SL he operated the W. G. Kummerich, Sauget/Toxic Landfill. Sauget/Toxic Landfill was used for disposal of processing waste from Monsanto Company of Sauget, Illinois.

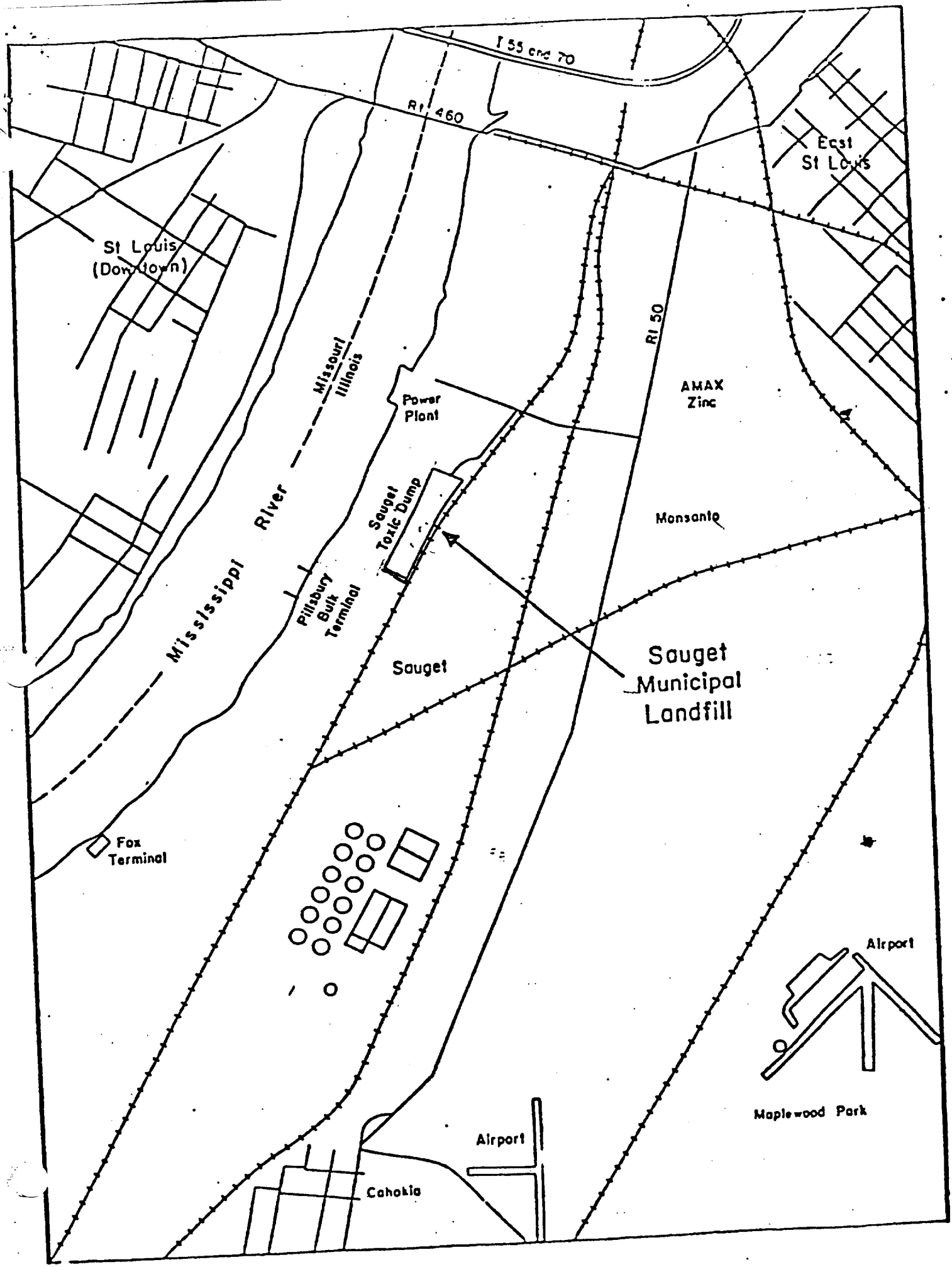


FIGURE 1. General Site Map

Assisted by E&E's personnel, TECHNOS performed all on-site work in modified level C safety, utilizing air powered purifying respirators to protect against inhalation of contaminated particulate matter.

The TECHNOS approach included two phases. In Phase I, three techniques, GPR, EMC, and magnetics, were evaluated on-site to determine the best method for locating drums. Phase II was conducted using a gradiometer magnetometer (which proved to be the best of the three geophysical methods tested in Phase I) along 33 parallel traverse lines spaced at 12.5 foot intervals across the site with readings every 12.5 feet thus, forming a grid and providing approximate total site coverage. A drawing of the site (to scale) with grid and gradiometer magnetometer results superimposed on it appear in TECHNOS Figure 7 (included in back plate pocket). The following significant information was derived from this survey:

1. Magnetic anomalies (intensity level 1, TECHNOS Figure 7) were recorded over most of the landfill which probably indicate the limits of landfilling.

2. Magnetic anomalies with greater intensity (levels 2 and 3, TECHNOS Figure 7) were located in several areas in the north-central and western portions of the site. These areas are delineated in TECHNOS Figure 7 and indicate burial areas of relatively large concentrations of steel/iron materials such as drums or car bodies.

3. The delineated magnetic variations may be caused by drum-like masses occurring at depths of 2 to 25 feet. If drums, these individual masses could represent 1 drum at a depth of 2 feet to as many as 50 drums to depths as 25 feet (over a surface of about 25 feet in diameter).

The information provided in the TECHNOS report allowed FIT to develop a drilling/sampling program on the grid while performing it in the safest manner possible. Every attempt to place borings equidistant to one another on the grid was made. However, the location of buried drums and an area of large cinder piles north of the 500 grid line prevented this. Borings here were placed in the only locations possible. Borings south of the 900 grid line were located on an equidistant pattern. The sampling program consisted of drilling 18 holes through the landfill in order to take 35 soil samples below it. Two split spoon samples of soil at different depths were taken below the bottom of the landfill and above the top of the water table with the exception of B16. The first soils encountered below the landfill in B16 were also found to be below the water table; therefore, the second soil sample was not collected.

Prior to any drilling at S/SL, all drilling equipment including tools and rig were steam cleaned under the supervision of E&E's personnel. Between borings, all tools, augers, racks, split spoons etc., were steam cleaned to prevent cross contamination. Between samples in each boring the split spoons were decontaminated by first washing them with tap water, secondly rinsing with acetone, and finally rinsing with distilled water.

All drilling and soil sampling at S/SL were done in modified level A safety. This entailed wearing Tyvec moon suits with clear bubble head gear and attached "life line" air lines.

Previous Studies

To date, the only site specific study of S/SL has been a thermal infrared survey done by Environmental Monitoring Systems Laboratory (Shelton, aerial 1982). The W. G. Krummrich AKA Sauget Toxic Landfill which borders Sauget/Sauget Landfill on the west side has been the subject of numerous studies including a hydrogeologic study by D'Appolonia.

CHEMICAL ANALYSES OF SOILS

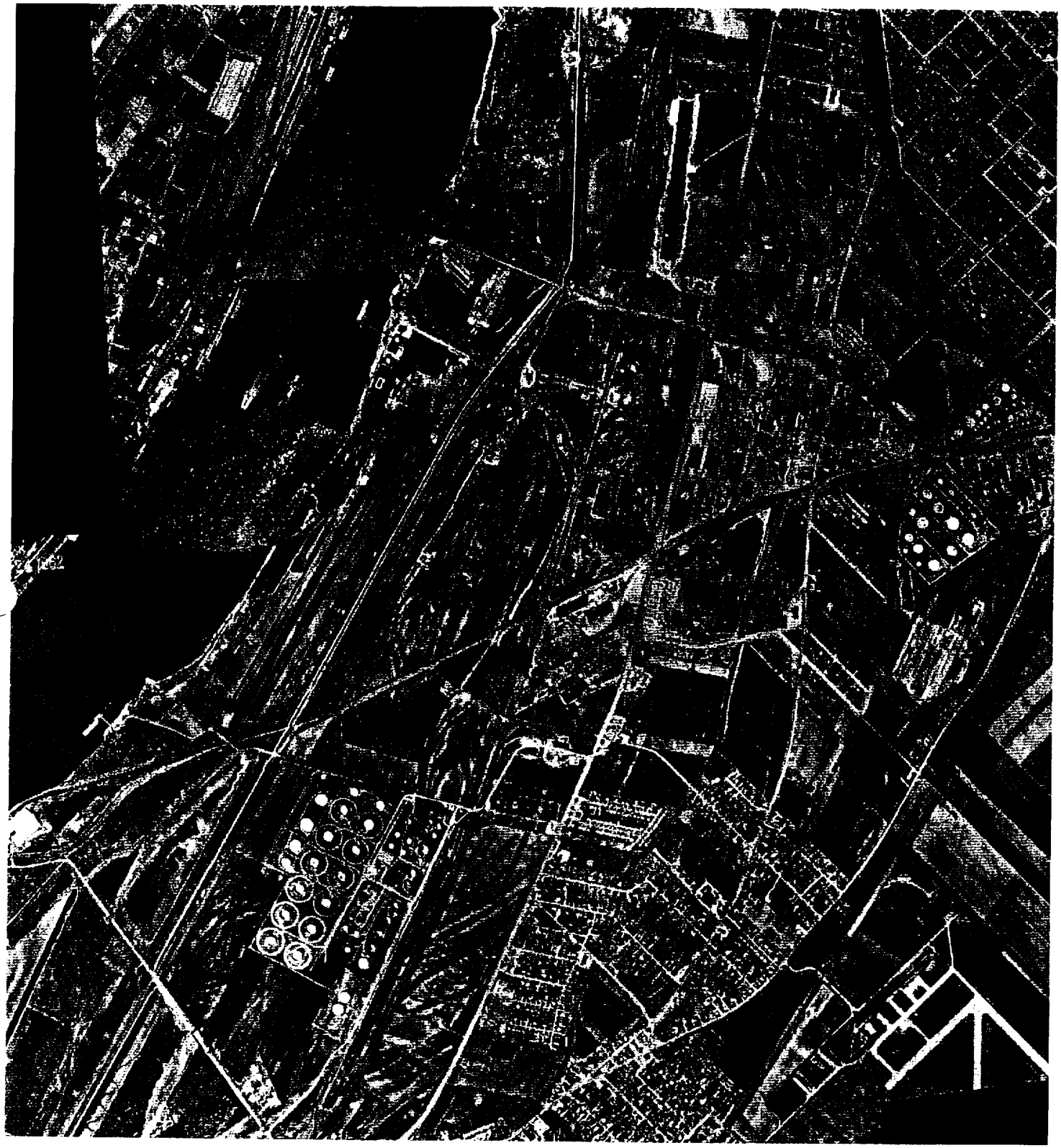
The 35 soil samples collected below S/SL were tested for 112 organic priority pollutants designated by the United States Environmental Protection Agency (U.S. EPA), a special analysis for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD), and selected non-priority pollutant hazardous substances. A list of compounds tested for and their detection limits appears in Table 1. Laboratory analyses of the 35 soil samples collected below S/SL appear in Table 2.

A survey of the soil analyses show high concentrations (over 1,000 ppb or 1.0 ppm) of organic contaminants including highs of 480 ppm of 2,4,6-trichlorophenol (B8A), 360 ppm of 2-chlorophenol (B4B), 3,100 ppm of 2,4-dichlorophenol (B1B), 72.0 ppm of 2,4-dimethylphenol (B4B), 100 ppm of pentachlorophenol (B4B), 250 ppm of phenol (B5B), 1.4 ppm of 2-methylphenol (B6A), 330 ppm of 4-methylphenol (B4B), 2.8 ppm of acenaphthene (B2B), 13,000 ppm of 1,2,4-trichlorobenzene (B14A), 620 ppm of 1,2-dichlorobenzene (B14A), 1,200 ppm of 1,4-dichlorobenzene (B14A), 1.2 ppm of fluoranthene (B2B), 17.0 ppm of isophorone (B11A), 380 ppm of naphthalene (B8A), 56.0 ppm of nitrobenzene (B4B), 1,100 ppm of bis(2-ethylhexyl)phthalate (B14A), 900 ppm of di-n-butyl phthalate (B14A), 23 ppm of di-n-octyl phthalate (B11A), 1.3 ppm of benzo(b)fluoranthene (B13A), 1.3 ppm of benzo(k)-fluoranthene (B13A), 6.4 ppm of chrysene (B11A), 2.0 ppm of fluorene (B2B), 5.2 ppm of phenanthrene (B11A), 5.6 ppm of pyrene (B11A), 51.0 ppm of aniline (B17B), 9.6 ppm of 4-chloranile (B16A), 3.0 ppm of dibenzofuran (B2B), 10.0 ppm of 2-methylnaphthalene (B11A), 4.6 ppm of 3-nitroaniline (B2A), 44.0 ppm of benzene (B14A), 100 ppm of chlorobenzene (B6A), 12.0 ppm of 1,2-dichloroethane (B6A), 19.0 ppm of 1,1-dichloroethane (B14A), 5.7 ppm of 1,1,2,2,-tetrachloroethane (B14A), 11.0 ppm of 1,2,-trans-dichloroethene (B14A), 790 ppm of ethylbenzene (B14A), 5.8 ppm of methylene chloride, 12.0 ppm of tetrachloroethene (B14A), 2,400 ppm of toluene (B14A), 55.0 ppm of trichloroethene (B14A), 14.0 ppm at acetone (B9B), 250 ppm of 4-methyl-2-pentanone (B14A), 64.0 ppm of styrene (B14B), 2,300 ppm of xylene (B14A), 170 ppm of PCB-1242 (B5A), 360 ppm of PCB-1254 (B5A), 70.0 ppm of PCB-1248 (B11B), 16,000 ppm of PCB-1260 (B14B), 46.0 ppm of PCB-1016 (B7B) and 66.0 ppm of total PCB (B5B). 1.6%

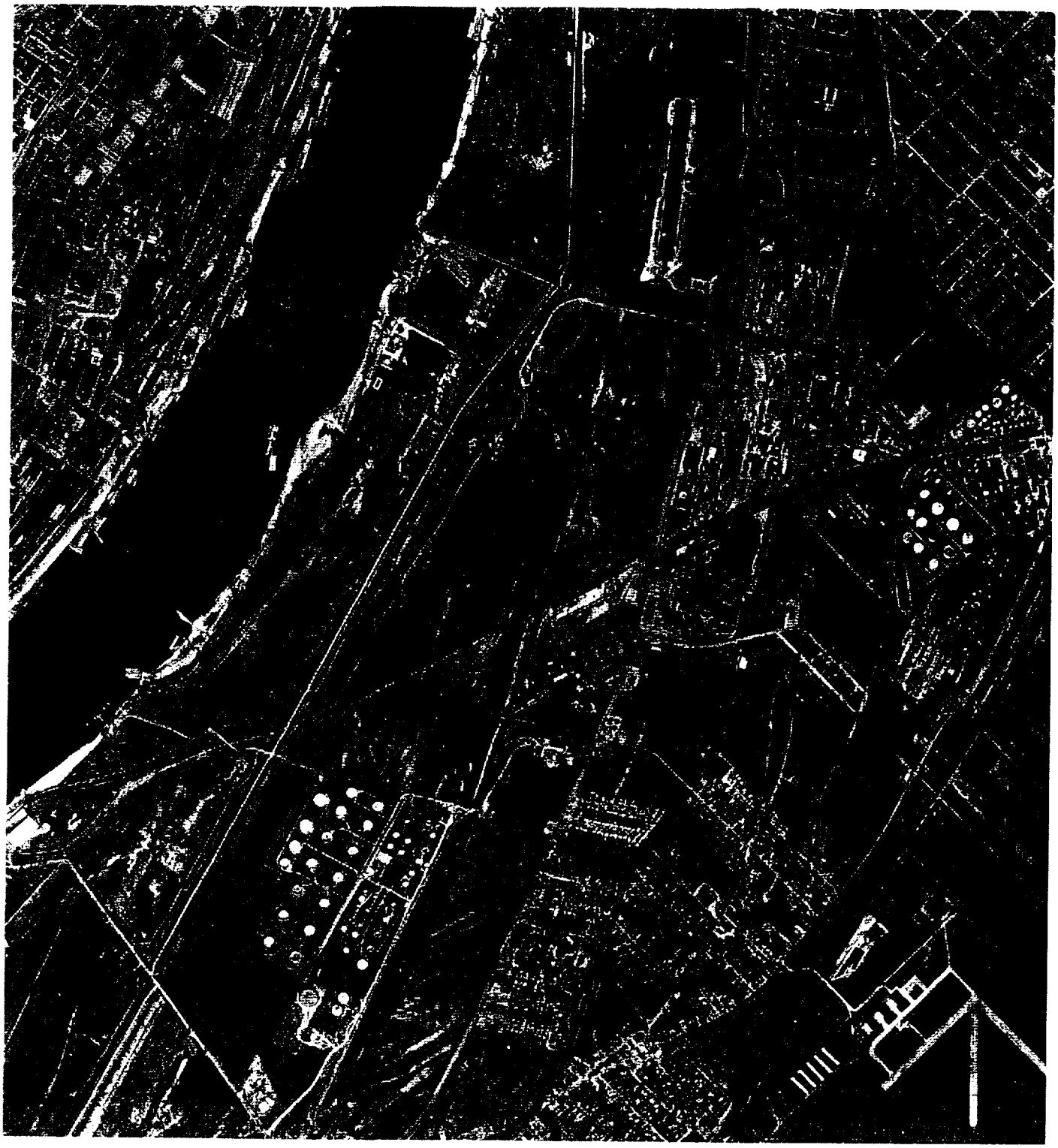
Exhibit 7

1955

1962

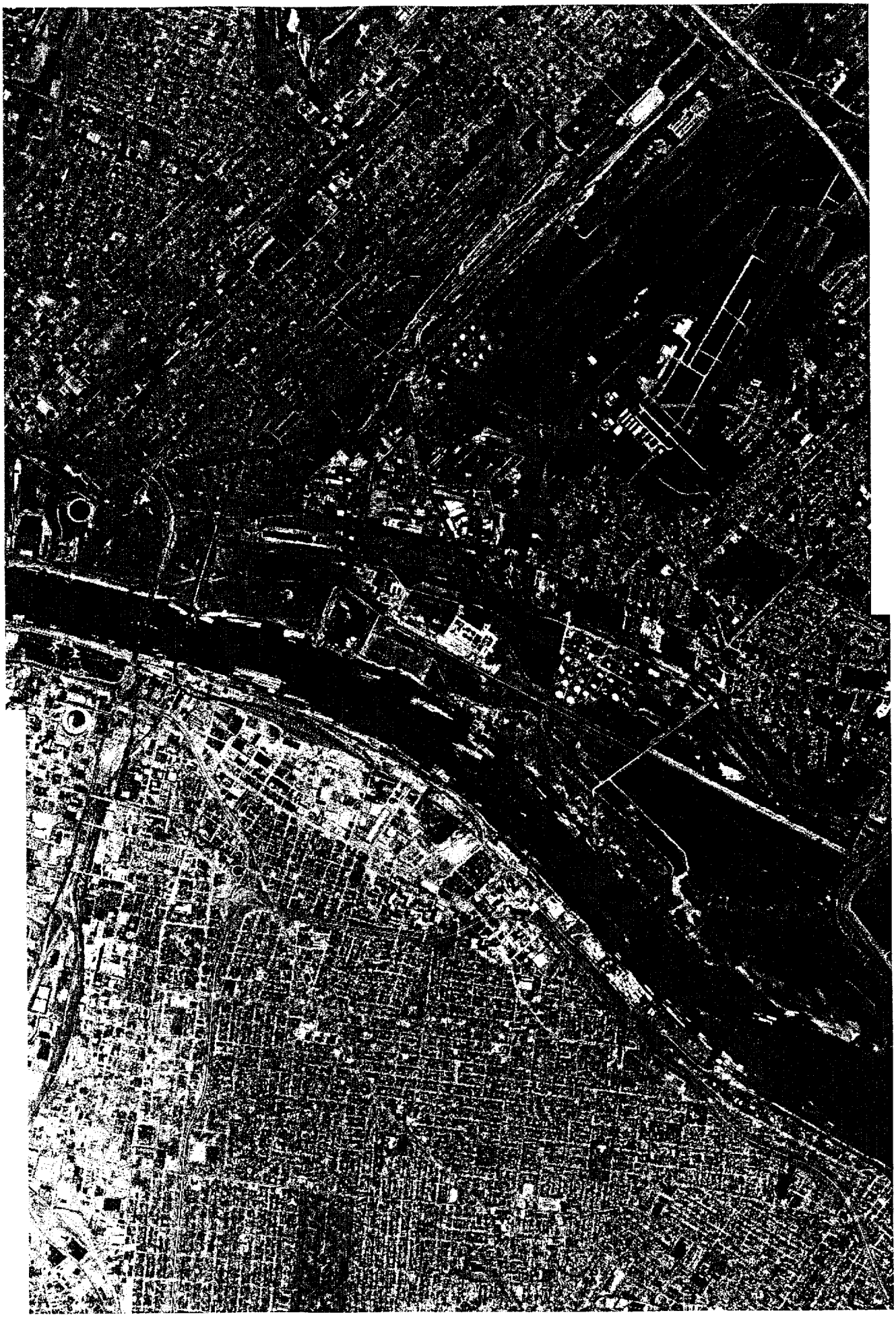


1964



1971

1996



REF 3b

EXPANDED SITE INVESTIGATION
DEAD CREEK PROJECT SITES
AT CAHOKIA/SAUGET, ILLINOIS
FINAL REPORT
VOLUME 2 OF 2

May 1988

Prepared for:

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
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I. INTRODUCTION

The RI portion of the Dead Creek Project Remedial Investigation/Feasibility Study, as described in the Project Work Plan, includes eleven tasks to be completed. Task 5, Description of Current Situation, calls for Ecology and Environment, Inc. to prepare a description of the background information pertinent to the area and its problems and outline the purpose and need for remedial investigation in the area.

This report was prepared to provide the information on and a description of the current situation of the sites in the Dead Creek Project area. The report is organized to provide an area wide description followed by a detailed site by site description. The site by site description provides a detailed presentation of all available information concerning each site, which was acquired and evaluated during Tasks 3 and 4 of the RI.

II. GENERAL DESCRIPTION OF PROJECT AREA

Location

The Dead Creek Project area is located in and around the cities of Sauget (formerly Monsanto) and Cahokia in St. Clair County, Illinois (Figure 1). Under the scope of the RFP issued by the IEPA, the study area consists of 18 suspected uncontrolled hazardous waste sites located throughout the study area (Figure 2). The project area consists of 12 individual sites and 6 additional sectors in Dead Creek.

Areal Description and Topography

The sites to be investigated as part of the Dead Creek Project are in an area which contains a mixture of industrial, residential, commercial, farm, and undeveloped land. The sites consist of closed and active landfills, industrial property, undeveloped or currently unutilized land, residential land, and an areal drainage flowpath (Dead Creek).

The project area is situated within the floodplain of the Mississippi River in an area known locally as the American Bottoms. Topography in the site area is controlled by structural features of the bedrock which resulted from glacial and fluvial occurrences. The Mississippi River meandered over the American Bottoms floodplain between the upland bluffs, which form the floodplain boundaries, prior to the establishment of the present channel. The meadering of the river has give- rise to typical floodplain characteristics throughout the study area. These features include low, broad, flat, swampy areas; terraces (generally found north of the study are); curved ridges and swales (typified as meander scars) formed as slack water bars or channels; alluvial fans; wetlands vegetation (although all vegetation is generally sparse due to industrialization and urbanization); mounds; and crescent shaped ox-bow lakes. The shifting of the Mississippi River channel has resulted in heterogeneous interbedding of fine and coarser material in the surficial flood plain deposits. Material has also been transported to the flood plain from the uplands and from the bluffs by overland flow which has resulted from rainstorms.

As in the case of most flood plains, the American Bottoms area is not perfectly flat. Many slight, naturally occurring and manmade, irregularities exist. However, in general the land surface at the site area is 400 feet above mean sea level. The land generally slopes from north to south and from the east toward the river. The wide floodplain area (approximately 6.5 miles across in the site area) exhibits little topographic relief except in the adjacent bluffs and upland areas which tend to be high (up to 150 feet above floodplain levels), steep, and moderately well drained. The local average land scope in the site area is 0.06% to the west. Regional floodplain slope is 0.0059% to 0.009% to the south (Fenneman, 1909; Jacobs, 1971).

Topographic maps for the study area were developed as part of Task 3 of the Remedial Investigation. The topographic maps are included as an attachment to this report, and an Index Map, Figure 3, depicts the

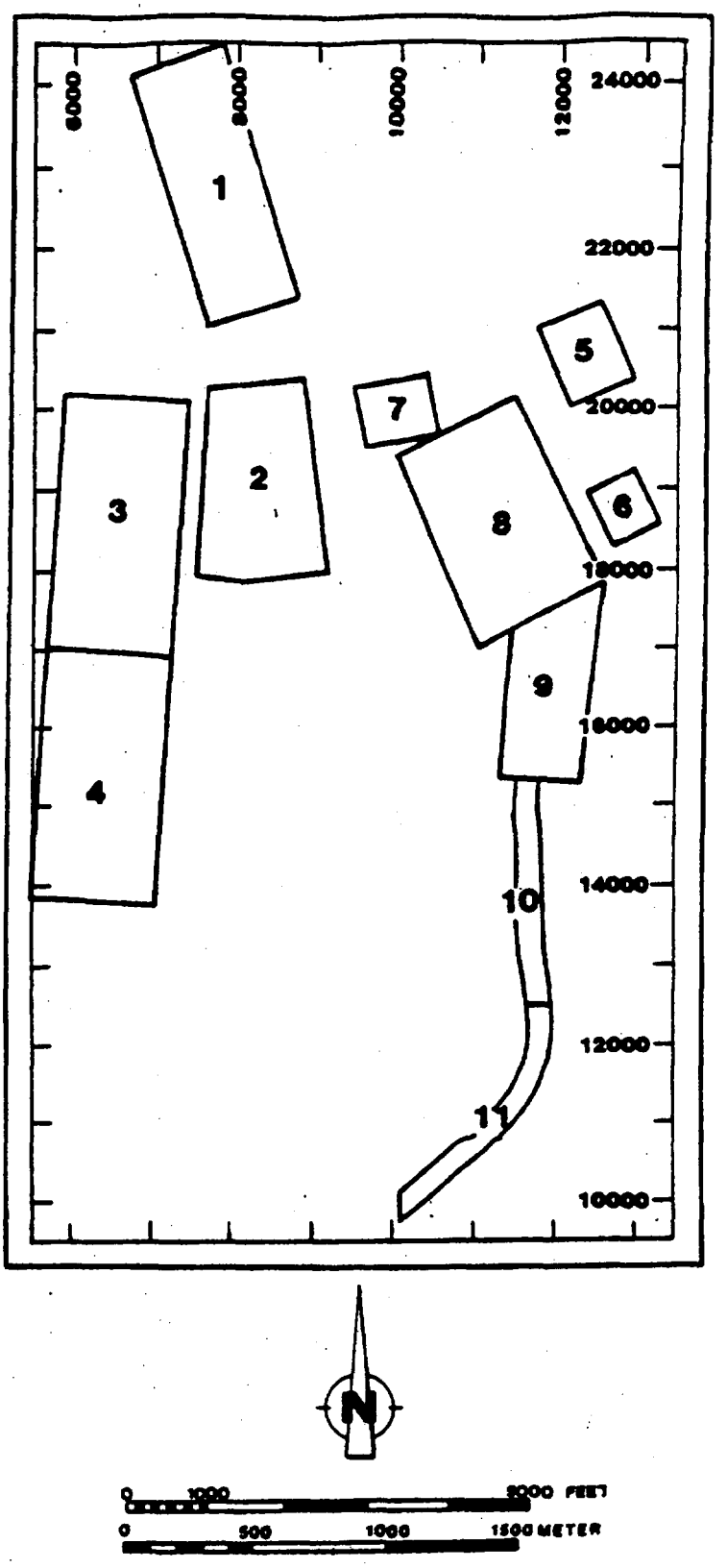


FIGURE 3
BOUNDARIES OF ENGINEERING PLATES FOR THE CEAD CREEK SITES

areal relationships of the topographic maps.

Climate

The climate in the site area is generally described as continental with hot, humid summers and mild winters punctuated by extremely cold periods of short duration. The site area is located in a major frontal convergence zone where warm, moist air from the Gulf of Mexico meets cold, dry air from Canada. This convergence zone produces a variety of rapid changes in weather conditions.

The 80-year average precipitation reported by Keefe (1983) was 35.4 inches per year, although the yearly average over the last 25 years (same data base) was up slightly to 39.5 inches per year. June is normally the wettest month, with an average of 4.3 inches of rain. Much of the summer rainfall is produced by thunderstorms, which are also responsible for the unusually heavy rains which periodically cause isolated flooding. Rainstorms which produce 1 to 2 inches of precipitation are common. Relative humidity typically ranges between 50 and 60 percent during the summer. Snow can occur in any and all months from November through April. Annual snowfall averages 17 inches.

The regional average annual temperature is 56° F. (Fahrenheit) with a January mean of 32° F. and a July mean of 79° F.. Periodic polar air fronts move through the area during the winter producing lows of -10 to-15 degrees Fahrenheit. July and August are typically hot and humid, producing temperatures above 90° F. on an average of 22 days/year. Highs in excess of 100° F. generally occur for short periods of 3 to 5 days.

Geology

The geologic formations present in the site study area consist of unconsolidated alluvium and glacial outwash, which are underlain by Mississippian and other bedrock layers. These bedrock layers are

underlain by basement granitic crystalline rock. The geologic formation sequence for South-Central Illinois is represented in Figure 4. The study area, the American Bottoms, and the Mississippi River channels are all located in a broad deep cut bedrock valley. The bedrock valley is delineated by bluff lines on both sides. Based upon available data, the bedrock valley has steep walls along the bluff lines while the valley bottom slopes gently toward the middle.

Within the bedrock valley, the Mississippi River has provided the primary mechanisms controlling the recent formation of geology and hydrogeology. Bergstrom, et al (1956) suggests that the bedrock valley is pre-glacial in nature; however, Willman et al (1970) concludes that insufficient data exists to suggest a pre-glacial valley structure for the Mississippi River. Nevertheless, glaciation did significantly modify and redesign the Mississippi River and its valley through both glacial and interglacial periods. These changes occurred as glacial wasting caused massive amounts of meltwater to be directed generally southward through and around bedrock and ice contacts, ultimately discharging into the Gulf of Mexico. Through geologic history, a wide and deep valley (2 to 8 miles across and up to 170 feet deep) has been carved into the predominantly soft sedimentary bedrock underlying the river (Bergstrom, 1956). Changes in stream flow, direction, and sediment load have caused this valley to fill with secondary alluvial sediments. These constantly changing parameters have resulted in the river continuously picking up and depositing (and cutting and filling) its sediment base, thereby directing and redirecting the river and its channels throughout time.

The unconsolidated valley fill, present in the bedrock valley, ranges in thickness from approximately 70 to 120 feet in the study area. The thickness of the valley fill in the region of the study area is depicted in Figure 5. A cross section of the valley fill in the vicinity of the study area is presented in Figure 6.

The valley fill deposits are typically comprised of two main formations which may reach as deep as 120 feet in the site area. The Cahokia, the uppermost formation, is comprised of predominantly silt,

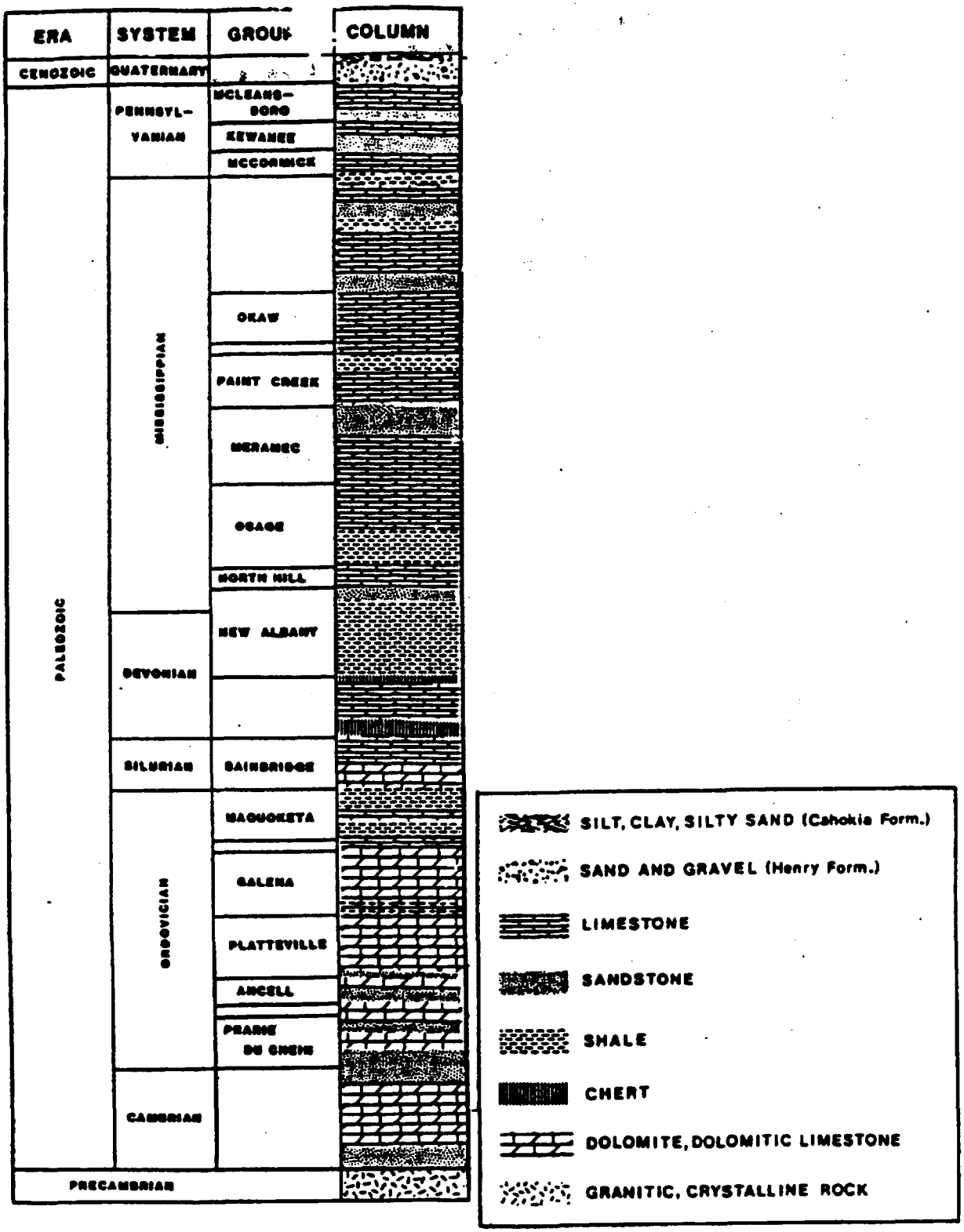


FIGURE 4
GENERALIZED GEOLOGIC COLUMN FOR SOUTH-CENTRAL ILLINOIS

clay, and fine sand deposits generally indicative of an aggrading environment. These deposits were laid down as flood events of the Mississippi River, eolian activity, bank slumping, erosion, and/or slugs of material deposited directly by tributary streams. This formation has been frequently reworked by the Mississippi River and typically consists of coarser material intertongued with finer grained deposits. As such, these deposits can be variable in thickness (ranging from 15 to 30 feet). Larger expressions of tributary deposits may form thicker alluvial fans where high energy streams dissipated and dropped their sediment load.

The second major formation of the floodplain setting is the Mackinaw Member of the Henry Formation. This formation underlies the Cahokia Alluvium, and is comprised of sand and gravel from glacial outwash. Within the study area, this material rests directly on the bedrock surface and can be highly variable in thickness (70 to 100 feet) due to the fluvial processes which formed it. This formation typically contains portions which are complexly interbedded due to meandering of the river throughout history.

A third minor formation noted locally within the floodplain, but not discovered within the site investigation area, is the Peyton Colluvium. This material is comprised of fine grained silt (loess) and clay (till) which has slumped from upland areas and accumulated at the base of steep bluffs.

Immediately adjacent to the floodplain (and 3.5 to 5 miles east-south east of the sites) is an upland area marked by a steep (50 to 150 feet above surrounding terrain) bluff. Structurally, these upland areas are based unconformably on bedrock (which has not been eroded as deeply as the adjacent valley), and consists of 10 to 100 feet of uncolsolidated sediments of predominantly glacial origin. No upland formations exist in the study area; however, erosion and slumping of the upland has provided the parent material for the Cahokia Formation and Peyton Colluvium, which are found in the floodplain.

The entire study area is underlain by relatively soft sedimentary rock layers. Typically, these rocks consist of shale, limestone, sandstone, and dolomite, which were formed through geologic time by lithification of sediment and sediment-like materials. In general, parent materials were disintegrated into sand, silt, clay, and mud, which were then deposited sequentially by sedimentary processes, such as precipitation and erosion. These sequential deposits (formations) were ultimately lithified by compression, compaction, reclystallization, and cementation. General depositional environments included shallow and deep seas, rivers, and swamps. These environments provided varying thicknesses of similar materials. Missing sequences apparently represent unconformities caused by terrestrial or near terrestrial erosional processes. These sedimentary rock sequences represent millions of years of geologic time.

The earliest sedimentary rock overlying the granite basement rock is Cambrian age sandstone limestone, dolomite, and shale. The Ordovician system overlies the Cambrian. Its formations consist of sandstone, dolomite, limestone and shale. Overlying the Ordovician is the Silurian System consisting of numerous limestone layers. Next youngest is the Devonian System, with limestone, sandstone, and shale formations. At the top of the sequence is the Mississippian System containing numerous limestone, shale, siltstone, dolomite, and sandstone layers. In the adjacent highlands and at one bedrock high located within the valley south of the site area, the Pennsylvanian System may be found to contain various sandstones, siltstones, and shale formations.

Bedrock structure in the area appears to be controlled by a significant fold (the Waterloo anticline) and fluvial erosion (primarily by the Mississippi River). The fold is centered approximately 6 miles south of the site area, and the structure trends north-northwest. This fold has bent the overlying rock in the area, producing a gentle northeast-east dip of up to 3 percent on the bedrock strata. This allows the deep strata to be exposed by bedrock

valley erosional processes to the southwest of the study area, while maintaining these same formations at a deeper elevation to the northeast of the study area.

Hydrology

The description of the hydrology of the study area is divided into the surface drainage and groundwater discussions presented below.

Surface Drainage

The Mississippi River extends far to the north and south of the site area and drains the American Bottoms and the tributary upland area. Although the Mississippi River floodplain is subject to periodic inundation by excess water runoff, most of the area is protected from massive regional flooding by a complex series of levees and other flood control structures. This condition partially adds to local small scale flooding problems since precipitation is trapped behind the flood control structures where drainage is typically poor. Dead Creek itself provides drainage for a portion of the American Bottoms, and ultimately discharges to the Mississippi River via the Prairie DuPont Floodway and Cahokia Chute. Fenneman (1909) has suggested that Dead Creek may at one time have been a southward extension of Cahokia Creek. Excessive siltation, realignment of surface drainage, or stream piracy may have redirected Cahokia Creek to its present channel, thus cutting off Dead Creek from the original source water.

Major surface drainage in the area is also provided by Cahokia Creek (to the north) and the Old Prairie DuPont Creek (to the south). Both of these creeks channel surface water directly into the Mississippi River. Significant additional secondary drainage within the site area and floodplain is provided by an extensive system of storm drains, pumping stations, and ditches, which were constructed or modified from existing natural drainage features for this purpose.

Groundwater

Groundwater exists in both the unconsolidated valley fill and the underlying bedrock formations. The Mississippian bedrock limestone and sandstone are water-bearing formations. Where these formations are located immediately below the unconsolidated material, there is sufficient groundwater for small or medium users. However, because of the abundance of groundwater present in the valley fill sand and gravel, the bedrock aquifer is of little significance to the study area. The majority of available groundwater in the study area is present in, and taken from, the valley fill materials. The Illinois State Water Survey has identified the study area as one in which the chances of obtaining a well yielding 500 gpm or more are good. The coarsest deposits, which are most favorable for water development, are commonly encountered near bedrock and generally average 30 to 40 feet in thickness. However, because of the alluvial nature of deposits in the study area, sand and gravel deposits which yield significant quantities of groundwater are commonly found in the study area nearer the ground surface.

Prior to development of the area, groundwater levels within the study area were very near the surface elevation of 400 ft MSL. As a result, ponds, swamps, and poorly drained areas were prevalent. The development of the area led to the construction of levees, drainage ditches, and wells, all of which caused the lowering of the groundwater levels. In the early 1960's, the extensive industrial pumpage in the study area (over 30 million gallons per day) resulted in a lowering of the water table by as much as 50 feet. However, due in part to the decrease in industrial groundwater use, groundwater levels within the study area have sustained a significant rise since the Mississippi River floods of 1973. Groundwater withdrawal within all of St. Clair County, in 1980, only amounted to 16 million gallons per day. As a result, measurements of monitoring wells near Dead Creek identified the water table at approximately 393 feet MSL (about 15 ft. below ground surface) in January 1981. Groundwater levels near other portions of the study area are expected to be similarly

depressed below ground surface except where affected by surface structure or well pumpage. Groundwater levels are affected by flood stages of the Mississippi River, and undergo water-level fluctuations as a result of seasonal weather patterns. In areas remote from major pumping centers, water levels generally recede in late spring, summer and early fall, when discharge from the groundwater reservoir by evapotranspiration, groundwater run-off to streams, and pumping from wells is greater than recharge. Recovery of water levels generally occurs in the early winter when conditions are favorable for infiltration of rainfall to the water table. Water level recovery is especially pronounced during the spring when the groundwater reservoir receives most of its annual recharge. Water levels are generally highest in May and lowest in December. Water levels remote from major pumping centers have a seasonal fluctuation ranging from 1 to 13 feet, with an average fluccuation of about 4 feet.

Based upon the surface drainage system for the region in 1900, R.J. Schicht (Illinois State Water Survey, 1965) estimated the piezometric surface prior to heavy development in the area. Groundwater elevation was estimated to be about 420 feet near the bluffs to about 400 feet near the Mississippi River. The piezometric surface had an average slope of about 3 feet per mile and ranged from 6 feet per mile in the Alton area to the north, to one foot per mile in the Dupo area to the south. The slope of the piezometric surface was greatest near the bluffs and flatest near the Mississippi River. Groundwater movement was generally directed to the west and south toward the Mississippi River and other streams and lakes.

Groundwater movement in the shallow deposits throughout the study area generally follow the land surface topography, with lateral movement toward local discharge zones (wells and small streams), and some movement into the deeper unconsolidated aquifers. Groundwater in the deeper unconsolidated deposits generally follows the bedrock surface. Accordingly, groundwater generally flows downstream through the sand and gravel aquifers in much the same direction as the original streamflow, but at a much slower rate.

In 1962, the general pattern of groundwater flow was slow movement from all directions toward the cones of depression, which had formed due to heavy pumpage, or toward the Mississippi River and other streams. In the study area, the lowering of the water table that accompanied groundwater withdrawal in the area established hydraulic gradients from the Mississippi River towards the pumping centers. In portions of the study area, groundwater levels were below the surface of the river and appreciable quantities of water were diverted from the river into the aquifer by the process of induced infiltration. Within the study area, the slope of the piezometric surface near the cone of depression, produced by pumping at the Monsanto facilities, exceeded 30 feet per mile.

The principal hydraulic properties of the valley fill and alluvium present in the study area indicate that the materials readily transmit groundwater and have a large amount of groundwater storage capacity. In 1952, tests were conducted for the Monsanto Chemical Corporation to evaluate the hydraulic properties of the deposits. The upper 40 feet of unconsolidated materials in the area consisted of sandy clay, and the lower 80 feet of unconsolidated material in the area consisted of various layers of sand and sand and gravel. A pump test was conducted on a well located 515 feet east of the Mississippi River and drilled to a depth of 99 feet. Six observation wells were used to assess the pump test. Using the time-drawdown method of analysis, the coefficient of transmissivity was determined to be 210,000 gpd/ft. The coefficient of storage was determined to be 0.082 (ft^3/ft^3), which is in the range typical of water table conditions. The coefficient of permeability was determined to be 2800 gpd/ft^2.

Recharge of groundwater in the study area is received from direct infiltration of precipitation and run-off, subsurface flow of infiltrated precipitation from the bluff area to the east, and induced infiltration from adjacent river beds, where pumpage has lowered the water table below the level of the river. Direct

recharge of the water table only captures a portion of the annual precipitation. A major portion of the precipitation runs-off to streams or is lost by the evapotransporation process before it reaches the aquifer. Nevertheless, precipitation is probably the most important recharge source for the study area as a whole. The amount of surface recharge that reaches the saturation zone depends upon many factors, including the character of the soil and other materials above the water table, the topography, vegetal cover, land use, soil moisture, depth to the water table, the intensity and seasonal distribution of precipitation, and temperature. Because of the low relief and limited runoff in the study area, and because the upper silt and clay fill is not so impermeable as to prevent appreciable recharge, most of the precipitation either evaporates or seeps into the soil. Because of the extensive flood-control network in the area, recharge from floodwaters provides a limited input to the area. Based upon a modified form of the Darcy equation, R.J. Schicht (1965) calculated the average rate of surface recharge to be about 371,000 gpd/sq. mi. for the study area.

Regional groundwater flow components to the west and south provide subsurface recharge to the study area. Schicht similarly estimated that the average recharge from subsurface flow of water from the eastern bluff boundary is 329,000 gpd/mi.

The lowering of the water table as a result of groundwater withdrawals in the study area has, in the past, established a hydraulic gradient from the Mississippi River toward the pumping centers. This resulted in water percolation through the river bed and into the aquifer, producing induced infiltration recharge. Schicht estimated the 1961 induced infiltration recharge volume for the study area to be approximately 18.5 million gpd, or roughly 58%, of the 31.9 million gpd total being withdrawn. Water withdrawal data from 1980 for the study area and areas to the north indicate that total withdrawals amount to only 3.9 million gpd as compared to more than 42 million gpd in 1961. Accordingly, for the study area, the amount of current induced infiltration from the Mississippi is

believed to be small due to dramatically reduced groundwater usage. Although current, detailed data for public and industrial water supply wells in the study area is presently unavailable, 1980 Illinois State Water Survey data indicated the presence of ten wells in or generally near the study area.

The chemical character of groundwater found in the study area varies geographically and with depth. Pumping rates and surface activities may also influence local quality. Generally, shallow wells (less than 50 feet deep) are quite highly mineralized and may have a high chloride content. Groundwater in heavily pumped areas often has high sulfate and iron contents and elevated hardness values.

Groundwater quality data developed by Schicht (1965) for Township 2N, Range 10W, Section 26, which includes a major portion of the study area, provides historical chemical data for wells with depths of approximately 100 feet. In general, the water quality was consistent. Hardness values ranged from 377 to 777 ppm, chloride values ranged from 9 to 61 ppm, and sulfate values ranged from 137 to 487 ppm. Recent Illinois State Water Survey data developed by Keefe (1983) identified a general increase in chloride and sulfate concentrations for groundwater in the study area. The general increase in chlorides was associated with the use of road salts since increased concentrations correlated with major highway locations. Increases in sulfate concentrations were speculated to be caused by an upward movement of high sulfate water from the bedrock as a result of pumping activities. Decreases in chloride and sulfate contents of groundwater were identified in a section along the Mississippi River where extensive nearby pumping had resulted in induced infiltration from the river.

SITE P - SAUGET/MONSANTO LANDFILL

Site Description

Site P is an inactive, IEPA-permitted landfill covering approximately 20 acres in Sauget, Illinois (Figure P-1). The site is bordered on the west by the Illinois Central Gulf Railroad; on the south by Monsanto Avenue, and on the east by the Terminal Railroad Association railroad. The two railroads converge to delineate the north boundary. Generally, the geology at the site consists of silty sand, underlain by fine grained to silty clay, followed by fine to coarse grained sands down to the bedrock. Surface drainage is to the south-central portion of the site, which was not landfilled due to the presence of a potable water line in this area. A depression area is also found along the east perimeter, adjacent to the Terminal Railroad. Surface drainage will not leave the site due to the presence of railroad embankments along the perimeter and the depression in the central portion of the site.

Site History and Previous Investigations

Sauget and Company entered into a lease agreement with the Union Electric Company in St. Louis to operate a waste disposal facility in 1972. In January 1973, IEPA issued an operating permit to Sauget and Company to accept only non-chemical waste from Monsanto. Sauget and Company subsequently applied for, and was granted, a supplemental permit in 1974 which allowed acceptance of general waste and diatomaceous earth filter cake from Edwin Cooper, Inc. (now Ethyl Corp.). The IEPA began conducting routine inspections of the facility in 1974, at which time no violations were evident. In October 1975, an inspector observed a small amount of yellowish, tar-like liquid in an area adjacent to several crushed fiber drums which were labelled "Monsanto ACL-85, Chlorine Composition." Sauget and Company and Monsanto were subsequently notified of this permit violation, and the matter was not further addressed. The site was operated in general compliance until December 1977, when an

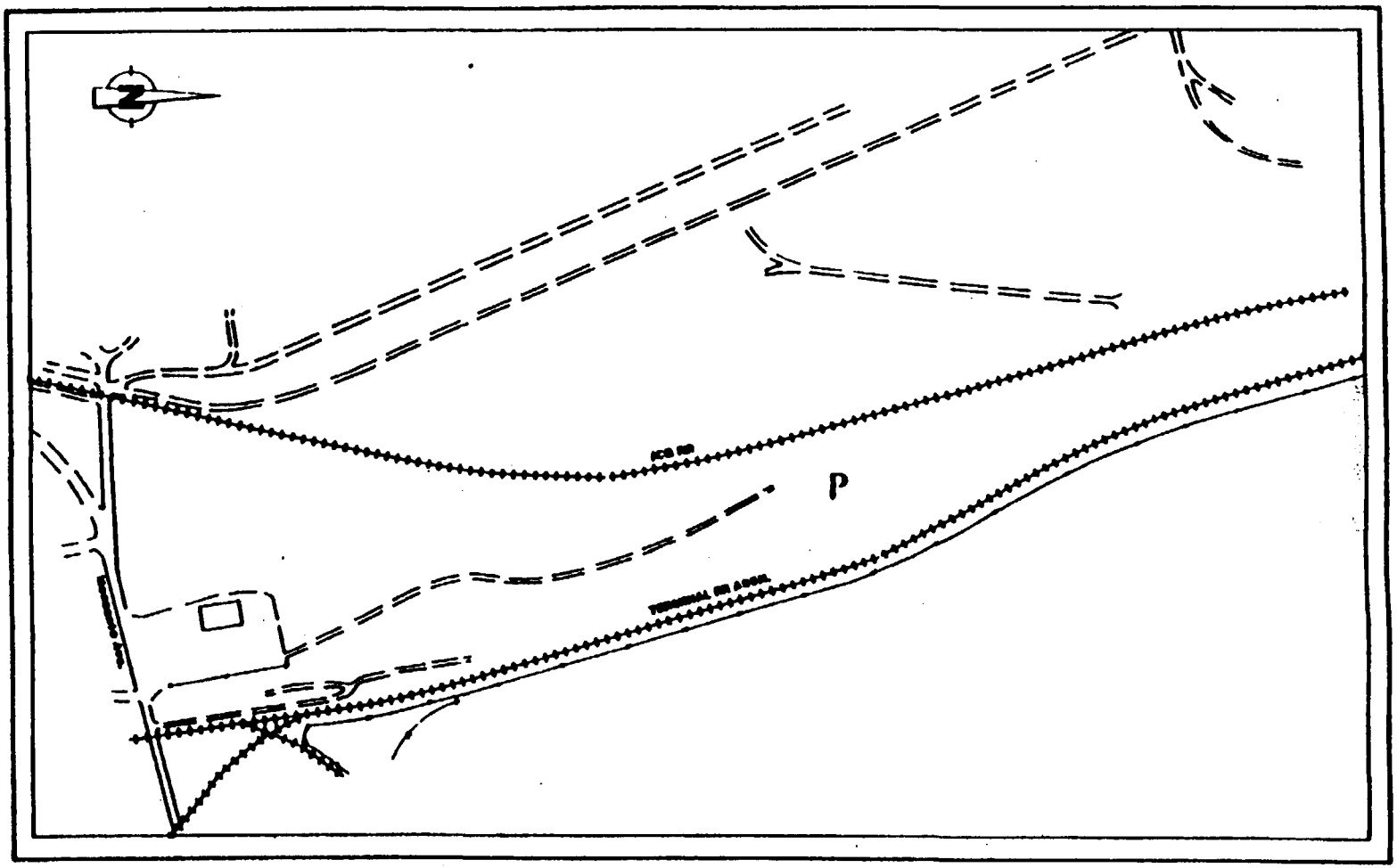


FIGURE P-1
DEAD CREEK SITE AREA P

inspection revealed the disposal of approximately 25 metal containers (12-15 gallon) full of phosphorus pentasulfide (P_2S_5), a flammable solid. Monsanto was required to excavate and remove all of this material from the site, and to discontinue disposal of any chemical wastes or packagings.

The IEPA became aware of another potential problem at this time, specifically the use of a Southern Railway slag pile for intermediate and final cover material. Analysis of this slag showed it to be unsuitable as cover due to its high permeability and heavy metal content. Cinders were also used as cover material at Site P, and are expected to pose the same problems as the slag; that is, increased surface water infiltration and the resulting potential for leaching heavy metals along with organic wastes into the groundwater.

State inspections in 1978 and 1979 indicated unpermitted disposal of Monsanto ACL filter residues and packagings. The composition of this material is not known. According to the site operator at that time, this material would occasionally ignite when in contact with the filter cake waste from Edwin Cooper.

An Illinois American Water Company distribution main was discovered in 1980 during preparatory excavation on the southern portion of the site. The south one-third of the property was purchased from Illinois Central Gulf in 1971 by Paul Sauget. Following discovery of the water line, Site Plans and permits were modified to include no waste disposal within 100 feet of the line.

Review of available IEPA records indicates that the Edwin Cooper filter cake is the only industrial process waste that was reported to have been disposed of at Site P. Records indicate that approximately 117,000 cubic yards of this material was accepted. The filter cake was classified as non-hazardous on special waste authorization permit number 7400017, based on EP toxicity results submitted in 1973. Additional analytical data is available for a filter cake composite sample from Edwin Cooper in 1979 which indicates elevated levels of

lead (18.4 ppm), cadmium (1.8), zinc (7,220 ppm), and a pH of 11.22. No groundwater monitoring program has been established for Site P, nor have wastes at the site been adequately characterized. No sampling or other field investigation activities have been conducted, other than routine IEPA inspections, at the site.

Data Assessment and Recommendations

A groundwater study consisting of installation and sampling of 6 wells is the only planned field investigation for Site P during the Dead Creek Project. Additional investigation will be necessary to adequately characterize the site and to provide an adequate data base for conducting the feasibility study if groundwater contamination is detected. Further evaluation of subsurface soil conditions at the site would be necessary in order to define waste characteristics and the vertical and lateral extent of contamination so that remedial alternatives can be assessed.

SITE Q - SAUGET/SAUGET LANDFILL

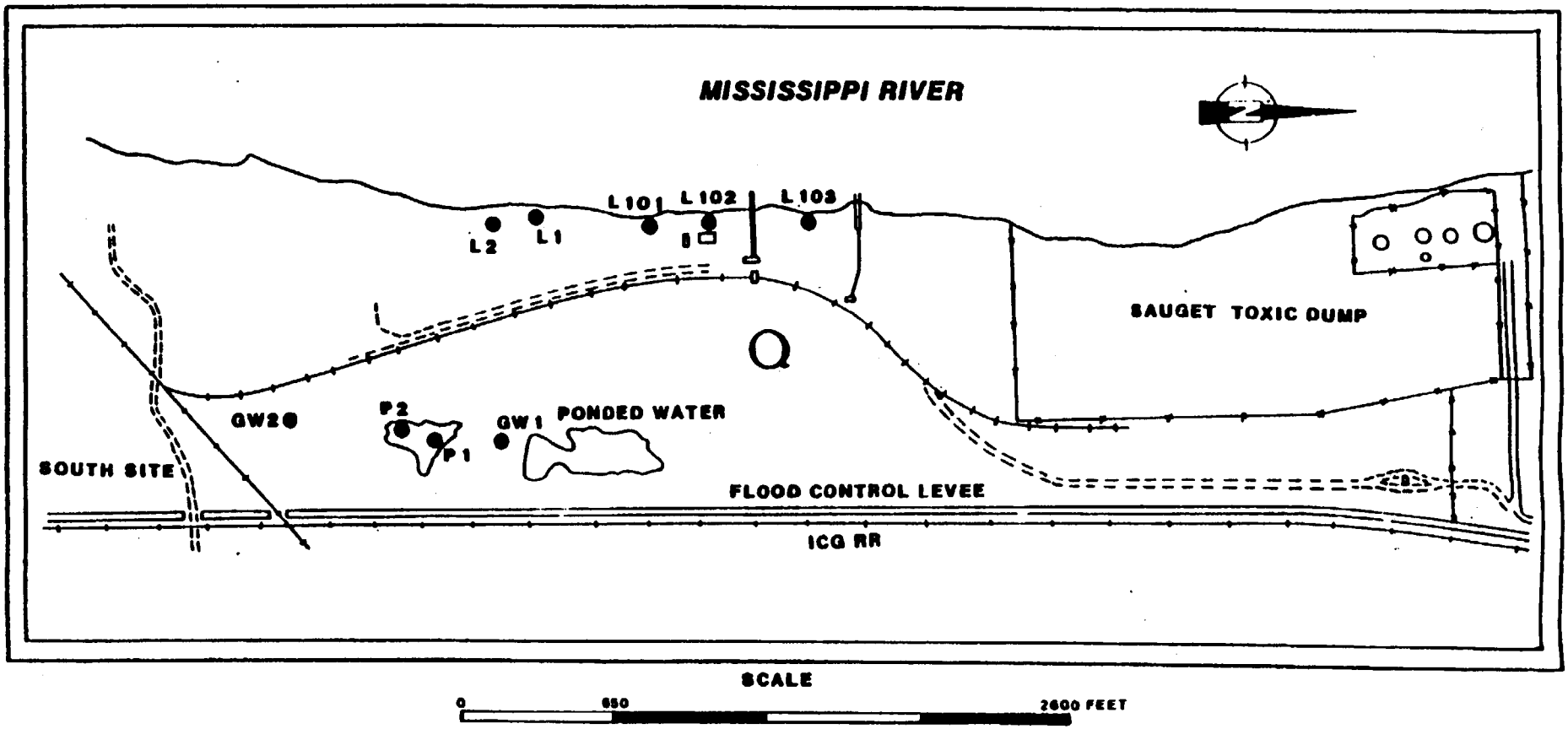
Site Description

Site Q is the Sauget/Sauget Landfill, an inactive waste disposal facility operated by Sauget and Company between the years 1966 and 1973. The site is approximately 90 acres in size, including a southern extension, as delineated by the Alton and Southern Railroad tracks (Figure Q-1). The site is located on east bank of the Mississippi River and is also on the river side of a U.S. Army Corps of Engineers flood control levee. Site Q is also situated immediately east of Site R, commonly known at Sauget Toxic Dump, a chemical waste disposal facility owned by the Monsanto Chemical Company.

Site Q was operated without a permit from IEPA, although registration with the Illinois Department of Public Health was obtained for the north site in 1967, prior to the formation of the IEPA. The site is presently covered with black cinders, which is an unsuitable cover material due to its high permeability. Site Q is presently owned by the Riverport Terminal and Fleeting Company, and the property is leased to the Pillsbury Company. Pillsbury operates a coal unloading facility at the site.

Site History and Previous Investgations

Disposal operations at Site Q began in approximately 1966 in the northernmost portion of the property. A Union Electric Company flyash pond existed at the site in an area immediately south of Monsanto's chemical dump. IEPA inspections in the early 1970's documented several violations of the Illinois Environmental Protection Act, including open burning, use of unsuitable cover materials (cinders and flyash), and acceptance of liquid chemical wastes. Septic tank pumpings were also accepted at the site from approximately 1968 to 1972, and were apparently co-disposed with general municipal refuse.



LEGEND

GW1	IEPA GROUNDWATER SAMPLING LOCATION
P1	IEPA SURFACE WATER SAMPLING LOCATION
L1	IEPA LEACHATE SAMPLING LOCATION

FIGURE Q-1
DEAD CREEK SITE AREA Q WITH SAMPLING LOCATIONS

in April, 1971, a complaint was filed by IEPA against Sauget and Company for the violations mentioned above. The company was ordered to cease and desist open burning, accepting liquid chemical wastes, open dumping, and use of cinders and flyash as cover material. In July, 1972, a smoldering underground fire was observed by IEPA inspectors at the site. The fire continued to smolder until October, 1972 despite repeated attempts to extinguish it. Underground fires were a continuing problem, as documented by later IEPA inspection reports. In the spring of 1973, flood waters from the Mississippi River inundated Site Q. This condition persisted into the fall, and operations at the site were discontinued. Exposed refuse was observed being carried downstream in the river at that time.

Sauget and Company filed a permit application to IEPA in 1972 for a proposed extension to the existing landfill. The proposed extension was located south of the Alton and Southern railroad tracks, and will be referred to as the south site. IEPA denied issuance of a permit for this extension several times, as Sauget and Company had filed repeated applications. Although approval of the south site was never issued, disposal operations continued in this area.

In the early 1970's, IEPA collected several samples from Site Q. Approximate sample locations are shown in Figure Q-1. Analytical data for samples collected from ponded water, leachate seeps, and ground water are provided in Table Q-1. The first set of samples, collected in October, 1972, consisted of one sample from ponded water, and one leachate sample. The results for these samples show the presence of several metals, including copper, iron, lead, mercury, and zinc. Ground water samples were collected in January, 1973 from two monitoring wells at Site Q. Information regarding construction details for these wells has not been located. Sample GW-1 showed trace levels of cadmium, silver, and phenols, while GW-2 showed very little evidence of contamination. Samples were again collected by IEPA from ponded water at Site Q on two occasions in April, 1973. Analytical results showed low levels of boron, cadmium, copper, iron, lead, manganese, mercury, nickel, and zinc in sample

TABLE O-3: ANALYTICAL RESULTS FOR SOIL SAMPLES AT SITE O. (SPLIT SAMPLES COLLECTED MARCH 12, 1983 BY IEPA AND EEI)

	PARAMETERS		
SAMPLE NO. (Depth)	TCDD - IEPA[a]	TCDD - EEI	COMMENTS
7A (0"- 6")			
7B (8" - 16")	1.8	44	
8A (0" - 6")	77	Interferences	
8B (6" - 12)	*	19	
8C (13" - 18")		37	
8D (18" - 25")		56	Duplicate
8D (18" - 25")			
9A (0" - 6")	1.3		
9B (6" - 12")	*		
9C (14" - 21")			
9D (22" - 28")	0.92		Control Sample
10A	12		Control Sample
10B	*	13	
11A (0" - 6")			
11B (G" - 18")	*		
12 (10" - 19")	*		
13A (0" - 7")			
13B (7" - 18")	13	13	
14 (0" - 6")	25	170	Composite of soil samples
15 (0" - 16")			
16 (0" - 18")			

NOTE: All results in ng/g (ppb).
Blanks indicate below detection limits.
* Sample not collected by IEPA.
a Hazelton Raltech, Inc. performed TCDD analysis for IEPA.

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TABLE Q-1: ANALYSIS OF SURFACE AND GROUND WATER SAMPLES COLLECTED BY IEPA AT SITE Q

	SAMPLE LOCATIONS AND DATES					
	10/17/72		1-17-73		4-10-73	4-26-73
PARAMETERS	P-1	L-1	GW-1	GW-2	P-2	P-3
Calcium	80	56	310	137	250	280
Magnesium	8	26	57	205	42	44
Sodium	23	169	275	13	230	205
Potassium	6	30	10	4	85	70
Ammonia	0.19	21	NA	NA	32	36
Boron	7	6.5	NA	NA	2.6	2.8
Cadmium			0.02		NA	0.02
Chromium (Total)					NA	0.03
Copper		0.01			0.02	
Iron		46			60	67
Lead		0.02			0.07	0.07
Manganese					6	6.5
Mercury (ppb)	0.5	0.5			0.4	0.6
Nickel					0.3	0.2
Silver			0.01			
Zinc		0.2		0.1	4.2	5
Alkalinity	46	810	645	375	420	
Chloride	19	4	310	24	210	205
Nitrate	NA	NA	NA	NA	NA	
Phosphate	NA	NA	NA	NA	3.7	5
Sulfate	230	18	325	25	350	270
Hardness	240	560	NA	NA	970	930
Phenols	NA	NA	0.02		NA	NA

NOTE: All results in ppm unless noted otherwise.
Blanks indicate below detection limit.
NA indicated parameter not analyzed.
P = Ponded water, L = Leachate, GW = Groundwater

P-2 and/or P-3. Although the data from samples collected in the early 1970's showed the presence of several contaminants, most notably phenol and heavy metals, no conclusive evidence of contamination at Site Q was obtained.

IEPA collected samples from leachate seeps along the Mississippi River in October, 1981 and again in September, 1983. The locations of these samples are shown in Figure Q-1, and analytical results are presented in Table Q-2. Data for the 1981 samples shows elevated concentrations of arsenic, chromium, copper, lead, managanese, and phosphorus in both samples. Additionally, low levels of phenols and PCBs were detected in the samples. The samples collected in September, 1983 show very similar results. Heavy metals and PCBs were again detected at concentrations very close to those seen in the earlier samples.

The cinders and flyash used as cover materials at Site Q have been the subject of numerous investigations and complaints by IEPA. In addition, the depth of final cover has been deemed inadequate, and enforcement action is pending on this matter. The Illinois Pollution Control Board Case Number 77-84 was filed against Sauget and Company and Paul Sauget in May, 1977. As a result of the findings in this case, a monetary penalty was invoked, and Sauget and Company was ordered to place two feet of suitable cover material on the entire site by February, 1981. Sauget's failure to comply with these orders led the Illinois Attorney General's office to file a similar case. Site Q has been a chronic enforcement problem, and recently Paul Sauget was found in contempt of court for failure to comply with court orders.

Laboratory tests run on the cinders and flyash indicate permeability values in the range of 9×10^{-3} centimeters per second, which is considered unsuitable by IEPA. In addition, metals analysis of the cover material showed unacceptably high levels of arsenic, copper, lead, and zinc. In 1972, IEPA collected samples from stockpiled flyash at Site Q, and ran leach tests for inorganic constituents.

TABLE Q-2: ANALYSIS OF LEACHATE SAMPLES FROM SITE Q (COLLECTED OCTOBER 28, 1981 AND SEPTEMBER 29, 1983 BY IEPA)

	SAMPLE LOCATIONS AND DATES				
	10-28-81		9-29-83		
PARAMETERS	L-1	L-2	L101	L012	L103
Alkalinity	255	293	191	158	242
Ammonia	3.8	2.8	6.5	4	3.7
Arsenic	0.057	0.022	0.11	0.034	0.012
Barium	0.8	0.2	0.5	0.4	0.3
Boron	5.8	5.6	37.5	42	23
Cadmium					
COD	445	35	87	94	71
Chloride	15	17	23	22	31
Chromium (Total)	0.08		0.03	0.01	
Copper	0.2	0.04	1.2	0.06	
Cyanide				0.01	0.01
Hardness	1330	1220	1225	1360	1045
Iron	207	17.5	86	36	6.4
Lead	0.26		0.13	0.08	0.02
Magnesium	145	67	81	73	44.5
Manganese	7.7	34	6.7	6.8	2.7
Mercury					
Nickel	0.3		0.1	0.1	
Nitrate	0.24	0.4	0.21	6.1	1.8
Phosphorus	6.1	0.74	3.1	1.3	0.86
Potassium	16.5	9.5	13.4	13.5	17
R.O.E.	1980	1829	1880	2118	1563
Silver	0.02	0.01	0.01		
Sodium	55.7	53.3	56	70	51
Sulfate	1196	1059	1200	1350	900
Zinc	1.2	0.2	0.3	0.2	
Phenol	0.005	0.005			
PCBs (PPB)	0.7	1	0.5		0.1
2,3-D(PPB)					

NOTE: All results in ppm unless noted otherwise.
Blanks indicate below detection limits.

Samples were taken from piles estimated to be 5 years old, 1 year old, and fresh material to determine the types and quantities of contaminants being leached from this material at the site. Analytical data for these samples are shown in Table Q-3. Analysis of the first set of samples (August, 1972) shows a distinct trend of the more soluble compounds, such as calcium, sodium and potassium, being leached from the fresh ash. However, the second set of samples, collected in October 1972, does not show a similar trend. The reasons for this discrepancy are not clear. The data in Table Q-3 also shows that significant quantities of metals are contained in the ash, particularly for the material estimated to be five years old.

IEPA's Notices of Violations concerning disposal of chemical wastes at Site Q in early inspections are supported by more recent information. Notification of Hazardous Waste Site Forms were submitted to USEPA from three companies for this site. These notifications indicate disposal of organics, inorganics, solvents, pesticides, paint sludges, and unknown wastes at the site. In May, 1980 workers uncovered buried drums and unknown wastes while excavating for construction of a railroad spur on the property. Workers observed a haze or smoke rising from the material after it was uncovered, suggesting corrosive and/or reactive properties.

In November, 1985, IEPA received a sketch from a reporter for a St. Louis newspaper indicating the location of buried drums containing PCBs. The reporter's source of this information is not known, nor has the information been verified to date.

As a result of the May, 1980 incident in which buried drums were unearthed, USEPA tasked its FIT contractor (Ecology and Environment, Inc.) to perform a detailed study to determine the extent of chemical contamination at Site Q. The study included a systematic geophysical investigation using EM, magnetometry, and ground penetrating radar (GPR), followed by a drilling and sampling program to investigate possible subsurface contamination. The investigation was limited

TABLE Q-3: ANALYSIS OF FLYASH USED AS COVER FROM STOCKPILES AT SITE Q (SAMPLED BY IEPA IN 1972)

PARAMETERS	SAMPLE NUMBERS AND DATES					
	8/3/72			10/16/72		
	5 Years	1 Year	Fresh	5 Years	1 Year	Fresh
Calcium	125	245	285	580	120	130
Magnesium	4.6	6.4	0.5	9	2	
Sodium	10	7.5	58	140	1.3	36
Potassium	7	11	79	56	2	45
Ammonia	1.8	0.36	0.47	0.75	0.05	0.15
Arsenic	NA	NA	NA			0.02
Barium	0.1		0.1			
Boron	0.9	3.6	1.8	1.3	0.6	2.4
Cadmium	0.01	0.01	0.02	0.02		
Chromium				0.03		
Copper	0.09	0.01	0.01	0.06		
Iron	1.3	0.1		0.85	0.1	
Lead	0.03			0.02	0.01	0.02
Manganese	0.69	0.03	0.03	0.75		
Mercury (ppb)	6			6.2		
Nickel	0.1	0.1	0.2	0.12	0.05	0.05
Silver	0.005	0.005	0.005			
Zinc	0.8	0.1		1.05	0.05	0.02
Alkalinity	140	65	120	120	80	135
Chloride	10	12	60	150	4	49
Flouride	0.2	0.2	0.1	0.3	0.3	0.2
Phosphate	NA	NA	NA	1.6	0.07	0.05
Sulfate	290	950	1300	1600	250	270
Hardness	420	1000	1400	1600	340	350
COD	250	33	52	460	26	45

NOTE: All results in ppm unless noted otherwise.
Blanks indicate below detection limit.
NA indicates parameter not analyzed.

to the northern portion of the site which amounts to approximately 25 percent of the site area.

Technos, Inc. of Miami, Florida was contracted to perform the geophysical investigation. This investigation was completed in June 1983. Results of the geophysical investigation identified the probable limits of landfilling and burial zones of relatively large concentrations of iron bearing materials such as drums or car bodies. These iron bearing zones were found in several distinct locations in the north-central and western portions of the study area.

Following the geophysical investigation, a drilling/sampling program was conducted to determine if subsurface soils were contaminated. The program consisted of drilling 18 test borings through the landfill, and collecting 35 soil samples for full priority pollutant analysis, as designated by USEPA. Subsurface soil samples were collected at depths ranging from 10 to 26 feet. Sample locations are shown in Figure Q-2. Analytical data for the soil samples are shown in Table Q-4, which consists of five pages. As can be seen in the table, a wide variety of organic compounds were detected at high concentrations in these samples. The sample analysis consisted of testing for 112 organic compounds, and 63 compounds were confirmed to be present in the subsurface samples.

Specifically, the data showed that thirty-four organic compounds were found at concentrations of 10 ppm or greater. Of these 34 compounds, 20 compounds were detected at concentrations 100 ppm or greater. And of these 20 compounds, 7 compounds were detected at concentrations of 1000 ppm or greater. Compounds detected at concentrations of 1000 ppm or greater include 2,4-dichlorophenol, 1,2,4-trichlorobenzene, 1,4-dichlorobenzene, bis(2-ethylhexyl) phthalate, toluene, o-xylene, and PCB-1260. In addition, 2,3,7,8-TCDD was detected in two samples (B4B and B8B). Compounds detected in samples taken from Site Q include many of the same compounds as detected in samples taken from Site R, the Sauget Toxic Dump site. Contamination was detected

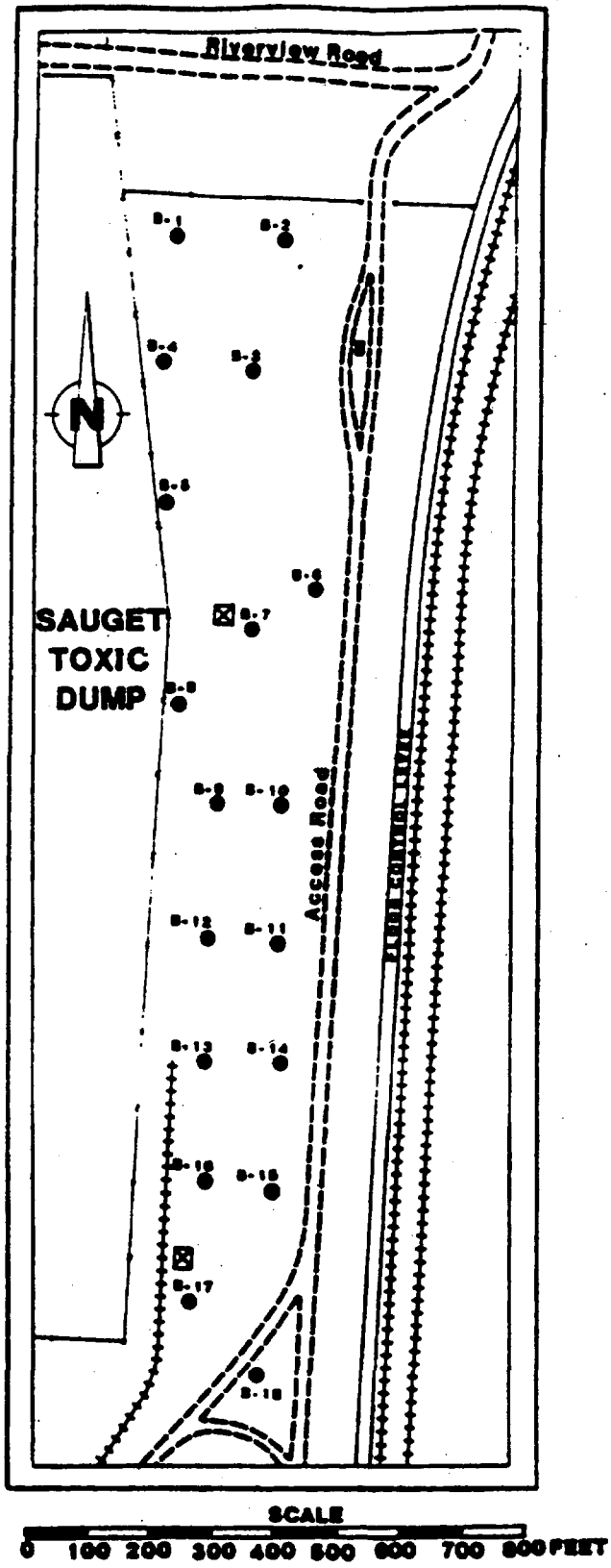

FIGURE Q-2
USEPA - FIT SUBSURFACE SOIL SAMPLING LOCATIONS AT SITE Q

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TABLE 8-4: IDENTIFIED ORGANIC COMPOUNDS IN SUBSURFACE SOIL SAMPLES FROM SITE 8 (SAMPLES COLLECTED JULY 13, THROUGH JULY 20, 1983 BY ECOLOGY AND ENVIRONMENT, INC.)

	BORING/SAMPLE NUMBER DEPTH (in feet)							
PARAMETERS	8IA 10.0-11.5	8IB 17.5-19.0	82A 13.5-15.5	82B 17.0-19.0	83A 10.8-12.8	83B 13.5-15.5	84A 10.0-12.0	84B 13.5-15.5
2,3,7,8-TCDD								3.51
2,4,6-trichlorophenol	2,500	170,000	22,000	520	1,600	1,500		96,000
2-chlorophenol	24,000	65,000	800		1,500	LT	57,000	340,000
2,4-dichlorophenol	66,000	3,100,000	31,000	1700	760	4,500		370,000
2,4-dimethylphenol			500					72,000
4,6-dinitro-2-methylphenol								
pentachlorophenol		86,000	5,400	LT		11,000		100,000
phenol	24,000	55,000	45,000	4,600	3,200	100,000	98,000	88,000
2-methylphenol- 4-methylphenol			LT		560	LT		330,000
2,4,5-trichlorophenol				LT				
acenaphthene			1,200	2,800				
1,2,4-trichlorobenzene				480			LT	100,000
1,2-dichlorobenzene	LT		LT			LT		20,000
1,4-dichlorobenzene			1,800	720	LT	760	LT	66,000
fluoranthene				1,200				LT
camphorene								
naphthalene			11,000	8,300				LT
nitrobenzene		8,900	400					56,000
N-nitrosodiphenylamine								
bis(2-ethylhexyl)phthalate				LT				62,000
butyl benzyl phthalate								
di-n-butyl phthalate	LT							LT
di-n-octyl phthalate								
diethyl phthalate								
benzo(a)anthracene								
benzo(a)pyrene								
benzo(b)fluoranthene								
benzo(k)fluoranthene								
chrysene				400				
anthracene								
benzo(ghi)perylene								
fluorene			600	3,000				LT
phenanthrene			1,000	2,700				LT
dibenzo(a,h)anthracene								
indeno(1,2,3-cd)pyrene								
pyrene			LT	LT				LT
aniline								
4-chloraniline			LT					
dibenzofuran			1,000	3,000				
2-methylnaphthalene			2,000	2,300				
3-nitroaniline			4,600					
benzene								
Chlorobenzene							10,000	40,000
1,2-dichloroethane								
1,1-dichloroethane								
1,1,2,2-tetrachloroethane								
1,2-trans-dichloroethene								
ethylbenzene								
methylene chloride			7.6	3.7	LN	8.0		
tetrachloroethene								
toluene								
trichloroethene								
acetone			960			977		LN
2-butanone								
4-methyl-2-pentanone						LT		
styrene								
O-xylene				2.0				5,100
PCB-1242								
PCB1254								
PCB-1248	1,000							
PCB-1260			485.2		69.6			
PCB-1016			2,120.6					
Total PCB							60,000	1,000,000

NOTE: All results in ppb.
LT = Present, but lower than the detection limit for low hazard analyses.
LN = Present, but lower than the detection limit for medium hazard analyses.
P= The sample could not be cleaned up sufficiently to yield TCDD results.
NA = Not analyzed, sample could not be cleaned up sufficiently.
Blank = not detected.

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TABLE B-4 (continued)

PARAMETERS	BORING/SAMPLE NUMBER Depth (in Feet) B5A 13.5-15.5	B5B 17.0-19.0	B6A 10.0-12.0	B6B 13.5-15.5	B7A 10.0-12.0	B7B 13.5-15.5	B8A 13.5-15.5	B8B 17.5-19.5
2,3,7,8-TCDD								0.11
2,4,6-trichlorophenol	130,000	26,000	2,700	4,000	2,700		480,000	10,000
2-chlorophenol	31,000	8,600	1,600	1,600	LT			
2,4-dichlorophenol	560,000	260,000	17,000	15,000	4,100		1,500,000	64,000
2,4-dimethylphenol			2,000					
4,6-dinitro-2-methylphenol								
pentachlorophenol				16,000	25,000	31,000		
phenol	140,000	250,000	65,000	11,000	1,800			
2-methylphenol-			1,400	600				
4-methylphenol		36,000	7,000	1,400				
2,4,5-trichlorophenol								
acenaphthene								
1,2,4-trichlorobenzene	86,000	13,000					120,000	
1,2-dichlorobenzene	100,000	28,000	LT				180,000	
1,4-dichlorobenzene			3,100	800				
fluoranthene								
isophorone								
naphthalene		LT	800	LT			380,000	LT
nitrobenzene	27,000	11,000	LT				52,000	
N-nitrosodiphenylamine								
bis(2-ethylhexyl)phthalate								
butyl benzyl phthalate								
di-n-butyl phthalate			400	LT				
di-n-octyl phthalate								
diethyl phthalate								
benzo(a)anthracene								
benzo(a)pyrene						LT		
benzo(b)fluoranthene						LT		
benzo(k)fluoranthene						LT		
chrysene						LT		
anthracene								
benzo(ghi)perylene								
fluorene								
phenanthrene								
dibenzo(a,h)anthracene								
indeno(1,2,3-cd)pyrene								
pyrene								
aniline								
4-chloroaniline			9,000					
dibenzofuran								
2-methylnaphthalene								
3-nitroaniline								
benzene						7.2	LM	
Chlorobenzene	18,000	27,000	100,000	8.4		4.2	7,100	
1,2-dichloroethane			12,000	3.4				
1,1-dichloroethane								
1,1,2,2-tetrachloroethane								
1,2-trans-dichloroethene								
ethylbenzene			44,000	3.8		4.5		
methylene chloride				15.8	86.0	45.0	LT	
tetrachloroethene					LT			
toluene			58,000	LT		6.1		
trichloroethene						LT		
acetone				330	200	2,600		
2-butanone				LT	LT	LT		
4-methyl-2-pentanone								
styrene								
O-xylene			140,000	13.0	LT	22.0		
PCB-1242	78,000						1,700	2,700
PCB1254	68,000							
PCB-1248				4,700				
PCB-1260					590	13,000	880	1,500
PCB-1016					2,300	46,000		
Total PCB		66,000						

All results in ppb.
LT = Present, but lower than the detection limit for low hazard analyses.
LM = Present, but lower than the detection limit for medium hazard analyses.
P = The sample could not be cleaned up sufficiently to yield TCDD results.
NA = Not analyzed, sample could not be cleaned up sufficiently.
Blank = Not detected.

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TABLE G-4 (Continued)

PARAMETERS	B9A 15.0-17.0	B9B 17.0-19.0	B10A 17.0-19.0	B10B 19.0-21.0	B11A 17.0-19.0	B11B 19.0-21.0	B12A 17.0-19.0	B12B 19.0-21.0
BORING/SAMPLE NUMBER								
DEPTH (in feet)								
2,3,7,8-TCDD			P		P	P		
2,4,6-trichlorophenol	LT	600	48,000	640			4,400	9,400
2-chlorophenol	640	1,100	1,700	LT			1,200	520
2,4-dichlorophenol	7,400	9,800	170,000	9,60	3,200	20,000	8,800	4,200
2,4-dimethylphenol		LT						
4,6-dinitro-2-methylphenol								
pentachlorophenol		4,800		2,200			24,000	920
phenol	7,500	14,000	32,000	11,000	6,200	37,000	17,000	7,500
2-methylphenol-								
4-methylphenol	1,400	2,300	2,700				1,000	720
2,4,5-trichlorophenol								
acenaphthene								
1,2,4-trichlorobenzene			11,000					
1,2-dichlorobenzene			11,000		LT			800
1,4-dichlorobenzene		LT	27,000		LT			1,000
fluoranthene					17,000	LT		720
isophorone			6,500		72,000	35,000	LT	640
naphthalene								
nitrobenzene						LT	LT	
n-nitrosodiphenylamine					52,000	34,000	440	
bis 2-ethylhexyl)phthalate	440				LT			
butyl benzyl phthalate								
di-n-butyl phthalate		1,500	LT		23,000	LT		
di-n-octyl phthalate								
diethyl phthalate	LT	840						
benzo(a)anthracene								
benzo(a)pyrene								1,000
benzo(b)fluoranthene								1,000
benzo(k)fluoranthene								
chrysene					6,400			
anthracene								
benzo(ghi)perylene								
fluorene					5,200			
phenanthrene								
dibenzo(a,h)anthracene								
indeno(1,2,3-cd)pyrene								
pyrene					5,600			
aniline								LT
4-chloroaniline								
dibenzofuran					10,000			
2-methylnaphthalene								
3-nitroaniline								
benzene			LM					
Chlorobenzene			5,200		LM			
1,2-dichloroethane								
1,1-dichloroethane								
1,1,2,2-tetrachloroethane								
1,2-trans-dichloroethene								
ethylbenzene			6,500		220,000			
methylene chloride	3.3	700	8,700	LT				
tetrachloroethene								
toluene			130,000		1,300,000	100,000		LM
trichloroethene					42,000			
acetone	210	14,000		4,400				
2-butanone							LT	
4-methyl-2-pentanone								
styrene								
B-xylene			30,000		450,000	70,000		LM
PCB-1242	600		NA					
PCB-1254			NA					
PCB-1248			NA		38,000	70,000		
PCB-1260	1,500	1,300	NA	120	45,000	681,000	7,000	5,000
PCB-1016								

All results in ppb.
LT = Present, but lower than the detection limit for low hazard analyses.
LM = Present, but lower than the detection limit for medium hazard analyses.
P = The sample could not be cleaned up sufficiently to yield TCDD results.
NA = Not analyzed, sample could not be cleaned up sufficiently.
Blank = Not detected.

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TABLE B-4 (Continued)

PARAMETERS	B13A 17.0-19.0	B13B 19.0-21.0	B14A 17.0-19.0	B14B 19.0-21.0	B15A 22.0-24.0	B15B 24.0-26.0	B16A 22.0-24.0	B17A 22.0-24.0
	BORING/SAMPLE NUMBER Depth (in feet)							
2,3,7,8-TCDD								
2,4,6-trichlorophenol	20,000	4,600			800	1,900	7,700	6,400
2-chlorophenol	2,500	3,800			600	1,600	4,600	100,000
2,4-dichlorophenol	9,400	11,000	440,000			11,000	27,000	120,000
2,4-dimethylphenol		LT					600	
4,6-dinitro-2-methylphenol	LT							
pentachlorophenol	12,000	44,000	14,000	16,000	4,200	12,000	39,000	26,000
phenol	8,900	15,000			6,800	13,000	16,000	50,000
2-methylphenol-4-methylphenol	920	1,400		16,000		1,0..	1,900	9,200
2,4,5-trichlorophenol							LT	
acenaphthene								
1,2,4-trichlorobenzene	2,400	3,000	13,000,000	2,000,000				
1,2-dichlorobenzene			620,000	55,000			LT	
1,4-dichlorobenzene	1,300	2,000	1,200,000	100,000		1,600	4,100	
fluoranthene								
isophorone				14,000				
naphthalene		LT	210,000	20,000		720	2,000	
nitrobenzene								
N-nitrosodiphenylamine		600						
bis(2-ethylhexyl)phthalate			1,100,000	220,000			4,600	
butyl benzyl phthalate				LT		LT		
di-n-butyl phthalate		LT	900,000	49,000	LT	3,000		
di-n-octyl phthalate		LT						
diethyl phthalate						LT		
benzo(a)anthracene								
benzo(a)pyrene	LT							
benzo(b)fluoranthene	1,300*							
benzo(k)fluoranthene	1,300*							
chrysene								
anthracene								
benzo(ghi)perylene	880							
fluorene								
phenanthrene								
dibenzo(a,h)anthracene	LT							
indeno(1,2,3-cd)pyrene	LT							
pyrene								
aniline							680	
4-chloroaniline	LT	2,200					9,600	
dibenzofuran								
2-methylnaphthalene				LT				
3-nitroaniline								
benzene			44,000					
Chlorobenzene			63,000	LM				
1,2-dichloroethane								
1,1-dichloroethene			19,000					
1,1,2,2-tetrachloroethane			5,700					
1,2-trans-dichloroethene			11,000					
ethylbenzene			790,000	330,000	LT			
methylene chloride	50.0	13.0	5,800		2.5	22.0		LM
tetrachloroethene			12,700					
toluene			2,400,000	340,000				
trichloroethene			55,000					
acetone	90.0	430			560	1,400		
2-butanone			LM					
4-methyl-2-pentanone		LT	250,000		LT			
styrene				64,000	4.2	3.3		
O-xylene			2,300,000	1,400,000		LT		
PCB-1242						5,000		
PCB-1254								
PCB-1248								
PCB-1260	770	1,300	2,900,000	16,000,000	190	1,000	370	68.0
PCB-1016					210			
Total PCB								

All results in ppb.
LT = Present, but lower than the detection limit for low hazard analyses.
LM = Present, but lower than the detection limit for medium hazard analyses
P = The sample could not be cleaned up sufficiently to yield TCDD results.
NA = Not analyzed, sample could not be cleaned up sufficiently.
Blank = Not detected.

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TABLE B-4 (Continued)

PARAMETERS	BORING/SAMPLE NUMBER Depth (in feet) B17B 24.0-26.0	B18A 22.0-24.0	B18B 24.0-26.0	Blank 1	Blank 2	Spike 81.0 ppb	Spike 81.0 ppb
2,3,7,8-TCDD						0.37	0.91
2,4,6-trichlorophenol							
2-chlorophenol							
2,4-dichlorophenol	3,800						
2,4-dimethyphenol							
4,6-dinitro-2-methylphenol							
pentachlorophenol							
phenol							
2-methylphenol-							
4-methylphenol							
2,4,5-trichlorophenol							
acenaphthene							
1,2,4-trichlorobenzene							
1,2-dichlorobenzene							
1,4-dichlorobenzene	550		LT				
fluoranthene					1,000		
isophorone							
naphthalene							
nitrobenzene							
N-nitrosodiphenylamine							
bis(2-ethylhexyl)phthalate	580	910	1,400	LT			
butyl benzyl phthalate							
di-n-butyl phthalate			LT				
di-n-octyl phthalate		LT					
diethyl phthalate							
benzo(a)anthracene		520			600		
benzo(a)pyrene					LT		
benzo(b)flu		LT			LT		
benzo(k)fluoranthene		LT			LT		
chrysene		640			540		
anthracene							
benzo(ghi)perylene							
fluorene							
phenanthrene					720		
dibenzo(a,h)anthracene							
indeno(1,2,3-cd)phrene							
pyrene		LT			800		
aniline	51,000	1,700					
4-chloraniline		960					
dibenzofuran							
2-methylnapthalene							
3-nitroaniline							
benzene							
Chlorobenzene	4.1						
1,2-dichloroethane							
1,1-dichloroethane							
1,1,2,2-tetrachloroethane							
1,2-trans-dichloroethene							
ethylbenzene	7.7						
methylene chloride	6.1	19.0	47.0	LM	6.9		
tetrachloroethene							
toluene							
trichloroethene							
acetone	2,000		268				
2-butanone							
4-methyl-2-pentanone							
styrene							
O-xylene	23.0						
PCB-1242							
PCB1254							
PCB-1248							
PCB-1260	160		2,400		260		
PCB-1016							
Total PCB		670					

All results in ppb.
LT = Present, but lower than the detection limit for low hazard analyses.
LM = Present, but lower than the detection limit for medium hazard analyses.
P = The sample could at be cleaned up sufficiently to yield TCDD results.
NA = Not analyzed, sample, could not be cleaned up sufficiently.
Blank = Not detected.

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across the entire area investigated, which suggests that disposal of large quantities of chemical wastes occurred specifically in the northern portion of Site Q and probably over the entire site area.

Data Assessment and Recommendations

The data developed to date for Site Q shows significant overall contamination at the site. Leachate samples collected from the west-central portion of the site contained phenols, PCBs, and several metals. Data collected prior to 1980 show general degradation of water quality, as evidenced by the analysis of leachate and pond water samples. The cinders and flyash used as cover material over the entire site have been shown to contain elevated levels of heavy metals, and also to be highly permeable. The subsurface soil investigation conducted in 1983 indicated widespread organic contamination to a depth of 26 feet in the northern portion of Site Q. This study provides the only depth and area-specific information available for the site concerning chemical contamination. Since the 1983 study was limited to approximately 25 percent of the total site area, it is apparent that further investigation is necessary for Site Q.

Field activities presently scheduled at Site Q for the Dead Creek Project include the installation and sampling of seven monitoring wells and ambient air monitoring. This would provide limited information concerning overall site contamination, but would not be adequate to permit a detailed feasibility study of specific remedial options. Further field activities should include additional geophysical investigations and subsurface soil sampling for areas not covered in the 1983 investigation, plus infiltration tests, hydraulic conductivity tests, ground water monitoring, and an assessment of the ground water hydrology in relation to the river.

The proposed geophysical surveys should be conducted in both on- and off-site areas to delineate any off-site migration of contaminant plumes and other possible drum burial areas. Infiltration tests would be conducted at several locations to determine the adequacy of

cover material, and to provide an estimate of leachate production. The ground and surface hydrology should be assessed over a period of time sufficient to address seasonal fluctuations. This assessment would provide data to determine ground water discharge and recharge in relation to the river. Additional investigation, if necessary, would be proposed following the completion of these activities.

SITE R - SAUGET TOXIC DUMP

Site Description

Site R is the Sauget Toxic Dump, an inactive industrial waste landfill used by the Monsanto Chemical Company between the years 1957 and 1977. Site R occupies approximately 36 acres adjacent to the Mississippi River in Sauget, Illinois. The site is located immediately west of Site Q, commonly known as the Sauget Landfill. Site R is presently covered with a clay cap and vegetated, and drainage is directed to ditches around the perimeter of the site. A Monsanto feedstock tank farm is located adjacent to the site on the northwest side.

Site History and Previous Investigation

Site R, also known as the Krummrich Landfill, was operated by Sauget and Company under contract with Monsanto. According to an Eckhardt Report summary sheet submitted in 1979 by Monsanto, approximately 262,500 tons of liquid and solid industrial wastes were disposed of at Site R from Monsanto plants in Sauget and St. Louis. In 1981, Monsanto submitted two Notification of Hazardous Waste Site Forms for Site R to the USEPA. The Monsanto W.G. Krummrich Plant (Sauget) listed 290,000 cubic yards (c.y.) of organics, inorganics, solvents, pesticides, and heavy metals as having been disposed at Site R. The Monsanto J. F. Queeny Plant (St. Louis) listed 6600 c.y. of the same waste types as above. Both notifications also indicated below-ground disposal of drums.

Monsanto has also submitted two reports to IEPA outling waste types and volumes disposed of at Site R for the years 1968 and 1972. Data compiled from these reports are summarized in Table R-1. This tabulation shows that the volume of wastes landfilled in 1972 was significantly lower than that in 1968 This reduction reflects the elimination of several major production operations at Monsanto's Krummrich Plant. By 1975, the majority of chemical waste disposal at

TABLE R-1: A LISTING OF WASTE TYPES AND APPROXIMATE QUANTITIES DEPOSITED AT SITE R AS REPORTED BY MONSANTO

	Approximate Annual Volume (Cubic Yards) 1968	1972
Still Residues From Distillation of:		
Nitroaniline and Similar Compounds	1700	94
Cresols, Esters of Phenol		1140
Chlorophenol, Chlorophenol Ether	1070	774
Aniline Derivatives	1300	208
Chlorobenzol	130	13
Nitro Benzene Derivatives	100	1190
Phenol	1020	
Aromatic Caboxylic Acids	1500	
Chlorinated Hydrocarbons		425
By Products		
Mixed Isomers of Nitrochlorobenzene	1700	785
Mixed Isomers of Dichlorophenol	3000	1240
Waste Maleic Anhydride	730	
Waste Chlorobenzenes and Nitrochlorobenzene	120	
Contaminated Acids and Caustic		
Waste Sulfuric Acid with Chloropenol Present	1500	1395
Waste Caustic Soda with Chlorophenol Present	5300	1760
Waste Solvents		
Waste Methanol Contaminated with Mercaptans	600	
Waste Isopropanol (Water and Chlorinated Hydrocarbon)	5500	
Miscellaneous Solvents	1019	
Oily Material	101	
Filter Sludges		
Spent Carbon or Other Filter Media	600	12
Lime Mud from Nitroaniline Production	1000	1195
Gypsum		5600
Obsolete Samples and Sampling Wastes		
Chlorophenols	72	40
Laboratory Samples	208	150
Total	28,270	16,021

NOTE: Blanks indicate waste type not reported.

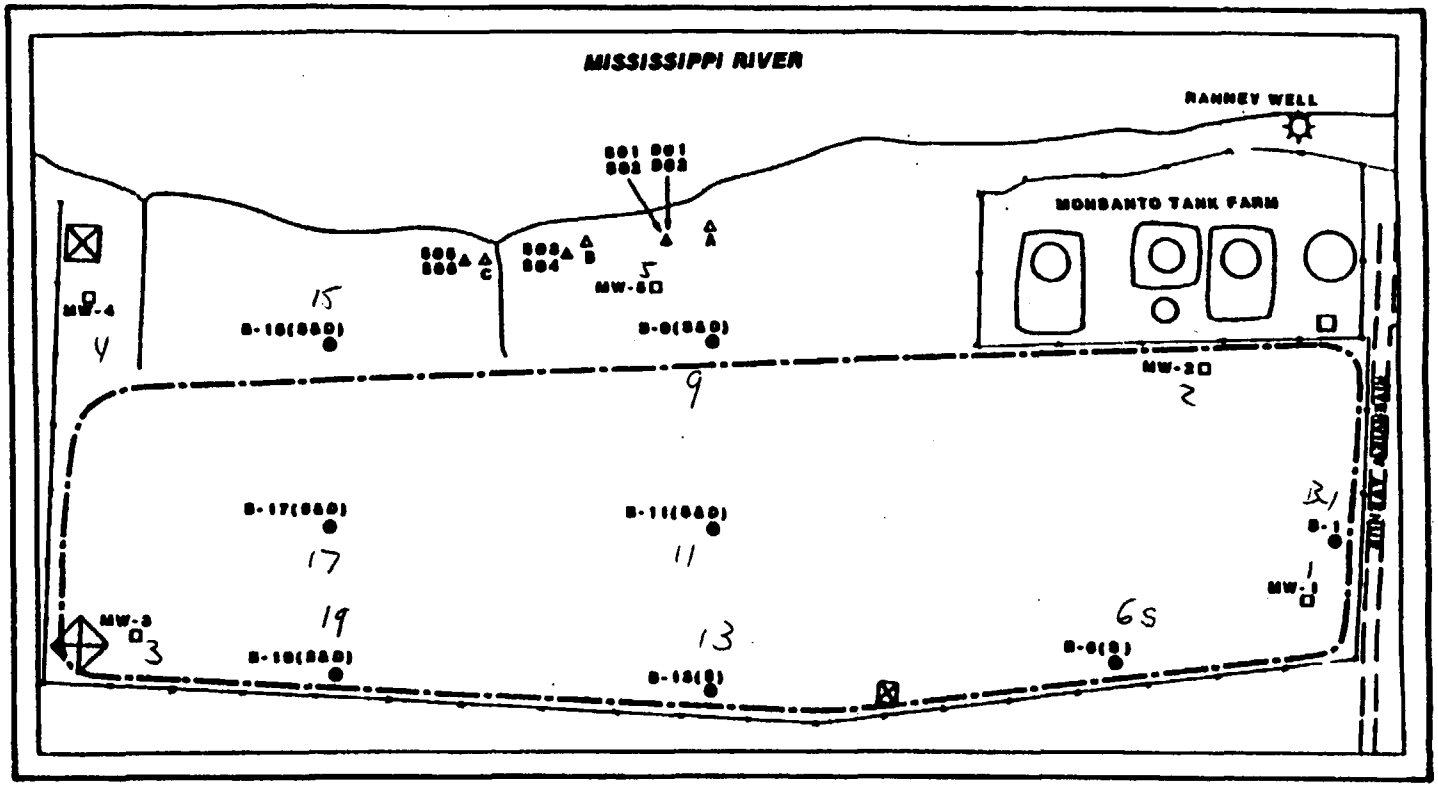
Site R had been terminated, as wastes were either hauled to other disposal facilities or incinerated on the plant site.

Very little information is available concerning disposal activities at Site R prior to 1967. In March, 1967, Sauget and Company filed an application for registration to operate a refuse disposal facility to the Illinois Department of Public Health. Health Department inspection reports from 1967 indicate disposal of liquid chemical wastes and metal containers from Monsanto. Liquids were pumped from tank trucks and drums into several pits around the site. Cinders were used as intermediate cover material.

In August, 1968, the Illinois Department of Public Health collected five ground water samples from on-site monitoring wells. The locations of these wells are shown in Figure R-1, and analytical results are presented in Table R-2. Phenols were detected in all wells at concentrations ranging from 15 to 1220 ppb. Alkalinity and total solids were also analyzed for, but no significant conclusions can be made from the data for these parameters.

IEPA began making routine inspections at Site R in 1971. Photographs of the site at this time suggest that wastes were disposed of in direct contact with the ground water. No segregation of liquid wastes was apparent in these photographs. IEPA collected another set of samples from the monitoring wells in December, 1972. Analytical data for these samples are shown in Table R-3. The results indicate concentrations of iron, zinc, and phenol above the State's water quality standards. Oil was also detected in wells MW-1 and MW-4. Samples were also collected from waste ponds at Site R by IEPA in January, 1973 and analyzed for phenol. Two samples were collected from pits identified as crystallization ponds, and one sample was taken from a spent caustic pond. Results for the waste pond samples are shown in Table R-4. High concentrations of phenols were detected in all samples.

In 1973, IEPA sent notices to Sauget and Company and Monsanto



LEGEND

A	IEPA LEACHATE & SEDIMENT SAMPLING LOCATION
S01	USEPA - FIT LEACHATE & SEDIMENT SAMPLING LOCATION
D01	DUPLICATE SAMPLE
MW-1	IEPA MONITORING WELL SAMPLING LOCATION (PRIOR TO 1979)
B-1	IEPA MONITORING WELL SAMPLING LOCATION (1979-1981)

SCALE
0 100 400 800 FEET

FIGURE R-1
STATE AND USEPA SAMPLING LOCATIONS AT SITE R.

TABLE R-2: ANALYSIS OF GROUND WATER SAMPLES FROM SITE R (COLLECTED AUGUST 22, 1968 BY THE ILLINOIS DEPARTMENT OF PUBLIC HEALTH)

PARAMETERS	SAMPLE LOCATIONS				
	MW-1	MW-3	MW-4	MW-5	MW-6
Total Solids (conductivity mmhos)	320	300	280	250	500
Alkalinity (ppm)	172	148	156	124	248
Phenol (ppb)	1220	25	20	15	1200

TABLE R-3: ANALYSIS OF GROUND WATER SAMPLES FROM SITE R (COLLECTED DECEMBER 5, 1972 By IEPA)

	SAMPLE LOCATIONS			
PARAMETERS	MW-1	MW-2	MW-3	MW-5
Calcium	50.2	147	36	49
Magnesium	15.8	36	18	18.5
Sodium	18.5	112	15	18.5
Potassium	3.6	6.7	4.2	3.5
Ammonia	1.5	2	0.65	0.92
Arsenic				
Boron	0.1	0.7	0.1	0.1
Cadmium				
Chromium (Total)				
Copper		0.1		
Iron	2.4	28.2	1.4	8.5
Lead				0.02
Manganese	0.35	0.61	0.12	0.95
Mercury				
Nickel				
Zinc	0.40	1.42	0.21	2.05
Alkalinity	180	430	145	185
Chloride	22	225	22	22
Fluoride	0.2	0.2	0.2	2
Nitrate	0.1	0.3	0.1	0.1
Phosphate	0.003	0.21	0.05	0.34
Sulfate	16	12	29	32
Conductivity (mmhos)	445	1400	390	470
Phenols	0.088	0.2	0.007	0.014
Oil	1	0	1	0
Hardness	200	530	170	200
COD	46	135	3	8

NOTE: All results in ppm.
Blanks indicate below detection limits.

outlining violations of the Environmental Protection Act at Site R. Violations noted included inadequate segregation of wastes, open dumping of chemical wastes, and operation of a disposal facility without the necessary permits. In addition, it was noted that the cinders being used as cover material was not in accordance with the Rules and Regulations set forth by the Illinois Pollution Control Board. These violations were reiterated several times in 1973 and 1974.

The monitoring wells at Site R were sampled annually between the years 1973 and 1976. In addition to the monitoring wells on site, a Monsanto production well (Ranney Well), located in the northwest corner, was also sampled. Results from these sampling efforts are summarized in Tables R-5 through R-8. Although specific pumping data for the Ranney Well could not be located, Illinois State Water Survey reports and file information suggests that pumpage of the well produced a significant cone of influence in the area. Sample data shows significant contamination in the Ranney Well, most notably with phenols and PCBs. COD, which is a non-specific indicator of organic contaminants, was also detected at much higher concentrations in the Ranney Well than in other wells sampled. Iron, mercury, and zinc exceeded water quality standards on one or more occasion during this time period. It should be noted that analysis of samples collected at Site R prior to 1976 was limited to inorganic parameters and phenols. Ground water samples collected in February, 1976 were analyzed for PCBs (Table R-8). The Ranney well was the only well to show a detectable concentration of PCBs (7.7 ppb).

IEPA monthly inspection reports from 1975 indicate a significant reduction in the volume of chemical waste disposal at Site R. Wastes were being shipped to other locations for disposal or were being incinerated at Monsanto's Krummrich Plant. Monsanto voluntarily ceased disposal operations at the site in 1977 and began closure proceedings. D'Appolonia Consulting Engineers, Inc. (D'Appolonia) was contracted by Monsanto to conduct a subsurface investigation of the site. Twenty soil borings were drilled and eight monitoring

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assign wells at 1977 Install Date

TABLE R-5: ANALYSIS OF GROUNDWATER SAMPLES FROM SITE R (COLLECTED FEBRUARY 22, 1973 BY IEPA)

	SAMPLE LOCATIONS				
PARAMETERS	MW-1	MW-2	MW-4	MW-5	RANNEY WELL
Iron	6.8	11	0.8	6.6	1.9
Manganese	0.35	0.55	0.05	1.05	0.92
Mercury (ppb)	0.4			0.2	
Zinc	1.9	0.6		1.5	
Ammonia	1.6	2.6	0.7	1.3	0.98
Phenol (ppb)	150	80			7500
BOD	31	48	1	1	85
COD	51	78	16	13	220

NOTE: All results in ppm unless noted otherwise.
Blanks indicate below detection limits.

TABLE R-6: ANALYSIS OF GROUND WATER SAMPLES FROM SITE R (COLLECTED MAY 6, 1974 BY IEPA)

	SAMPLE LOCATIONS					
PARAMETERS	MW-1	MW-2	MW-3	MW-4	MW-5	Ranney Well
Arsenic	0.001	0.001	0.005		0.001	0.002
Barium	0.1	0.3	0.2	0.1	0.2	0.2
Boron	0.3	0.9	8.4	0.2	0.1	
Cadmium		0.02				
COD	44	990	21	14	17	340
Chloride	90	215	30	17	16	25
Cyanide		0.008				0.005
Iron	15	43.2	11.9	2.71	7.5	2.65
Lead	0.008	0.01		0.008	0.014	0.95
Manganese	0.69	1.4	1.1	0.2	0.9	0.95
Nitrate						0.4
Oil	4	7	1			5
Phenols	0.35	120	0.1	0.02	0.1	15
R.O.E.	720	1600	750	270	240	820
Selenium						
Sulfate	220	78	305	48	41	31

NOTE: All results in ppm.
Blanks indicate below detection limits.

TABLE R-7: ANALYSIS OF GROUND WATER SAMPLES FROM SITE R (COLLECTED OCTOBER 28, 1975 BY IEPA).

	SAMPLE LOCATIONS			
PARAMETERS	RANNEY WELL	MW-2	MW-4	MW-5
Ammonia				
Arsenic	0.002		0.002	
Barium	0.1	0.1	0.1	0.2
Boron	0.7	0.9	0.5	0.2
Cadmium				
COD	345	210	12	16
Chloride	110	200	23	20
Cyanide		0.02	0.01	
Iron	4.5	13.4	1.45	11
Lead	0.02		0.01	0.04
Manganese	1.3	0.2	0.1	0.7
Nitrate		0.3	0.2	0.1
Oil	3	6	2	3
Phenol	19	1.1	0.025	0.013
R.O.E.	300	920	230	200
Selenium	0.02			
Sulfate	95	6	22	15

NOTE: All results in mg/l, (ppm).
Blanks indicate not detected.

TABLE R-8: ANALYSIS OF GROUNDWATER SAMPLES FROM SITE R (COLLECTED FEBRUARY 17, 1976 BY IEPA)

	SAMPLE LOCATIONS					
PARAMETERS	MW-1	MW-2	MW-3	MW-4	MW-5	RANNEY WELL
Arsenic						0.001
Barium				0.2	0.3	0.1
Boron	0.3	0.8	8	0.5	0.1	1.4
Cadmium						
COD	28	130	8	16	15	390
Chloride	60	410	65	35	35	250
Cyanide	0.01	0.01	0.01	0.01	0.01	0.01
Iron	5.1	19.5	4.3	0.7	7.1	4.6
Lead	0.01	0.02			0.02	
Manganese	0.27	0.27	0.1	0.1	0.85	1.45
Nitrate	0.8	0.1				0.3
Phenols	0.03	0.01				
ROE	370	890	260	220	260	900
Selenium						
Sulfate	110	20	100	44	36	180
PCBs (ppb)						7.7

NOTE: All results in mg/l (ppm) unless noted otherwise.
Blanks indicate below detection limits.

wells were installed. The D'Appolonia study concluded that the landfill area consisted of 5 to 20 feet of flyash, cinders, silty clay, and unidentified waste. The landfill is underlain by alluvium, consisting of fine sands, silt, and clay ranging in thickness from 5 to 50 feet. Field permeability tests showed that alluvium is fairly permeable (1×10^{-3} cm/sec) suggesting that silty sand is the major component of the alluvium. This finding is supported by the evidence of vertical migration of contaminants to a depth of 65 feet, as suggested in the boring logs. Water levels were generally 25 to 30 feet below ground surface.

In May, 1978, Monsanto filed closure documents to IEPA detailing a closure plan for the site. In general, the plan consisted of specifications for the installation of a drainage system and clay cap, along with details for grading, seeding, and access restriction. The Helmkamp Construction Company was retained to implement the closure plan. An IEPA inspection report from October, 1979 indicated that closure operations at Site R were complete, including installation of a clay cap 3 to 6 feet in thickness. In February, 1980, Richard Sinise, an Environmental Control Engineer for Monsanto, filed an Affidavit of Closure for Site R.

IEPA personnel collected ground water samples from monitoring wells installed by D'Applonia in October, 1979 (Figure R-1). The samples were analyzed for inorganics and organic parameters reported by Monsanto to have been disposed of at the site. Analytical results for these samples are shown in Table R-9. Analysis showed the presence of several organic contaminants in the wells. Both shallow (25 to 35 feet) and deep (60 to 70 feet) wells were sampled, and chlorotoluene and phenol were found in all wells sampled. Well B-19S, located in the southeast portion of the site, also showed chlorophenol, dichlorobenzene, and diphenyl ether at concentrations ranging from 0.81 to 2.1 ppm. Iron, copper, and zinc exceeded water quality standards in several wells. Another set of samples was

TABLE R-9: ANALYSIS OF GROUNDWATER SAMPLES FROM SITE R (COLLECTED BY IEPA ON OCTOBER 12, 1979)

PARAMETERS	SAMPLE LOCATIONS					
	B-9S	B-9D	B-13D	B-15S	B-17S	B-19S
Inorganics						
Arsenic	0.01	0.004	0.002	0.002	0.002	0.007
Cadmium	0.02		0.01			0.01
Chromium	0.03		0.04			0.03
Copper	1.2	0.32	0.87	0.14	0.42	1.6
Iron	290	100	130	56	110	230
Lead	0.2		0.3		0.1	0.2
Magnesium	31	10	27	83	11	28
Manganese	7.8	1	1.4	1.8	0.99	2.8
Nickel	0.6	0.2	1.9	0.1	0.1	0.2
Zinc	3.3	0.36	3	0.4	0.52	0.87
Organics						
Aliphatic hydrocarbons				*	*	*
Chlorophenol	*	*				0.81
Chlorotoluene	70	40	10	0.34	11	18
Dichlorbenzene						1.6
Diphenylether					0.32	2.1
Phenol	21	56	10	14.3	41.5	22

NOTE: All results in ppm
Blanks indicate below detection limits
* Contaminants present, but not quantified

collected by the IEPA from the D'Appolonia monitoring wells in March, 1981. These samples were analyzed specifically for organic compounds. Analytical data for these samples are shown in Table R-10. Concentrations of organic contaminants were detected in all wells sampled. Chlorobenzene (130 to 3000 ppb) was detected in all wells, while biphenylamine, chlorophenol, dichlorobenzene, and dichlorophenol were seen in five or more wells.

In October, 1981, IEPA collected leachate and sediment samples at Site R from an area adjacent to the Mississippi River. Leachate and sediment samples were collected from three locations where leachate seeps were observed flowing from the landfill into the river. Analytical results for these samples are presented in Table R-11, and locations of the samples are shown in Figure R-1. The three water samples showed contamination with a wide variety of organic compounds. PCBs and chloroaniline were detected in all sediment samples. Other compounds detected in sediment samples included 2,4-dichlorophenoxy-acetic acid (2,4-D), chloronitrobenzene, dichloroaniline, chlorophenol, biphenyl-2-ol, and dichlorophenol. The presence of 2,4-D and chlorinated phenols in these samples suggested that dioxin was also a potential contaminant at the site. The IEPA subsequently requested assistance from USEPA in securing a laboratory to perform dioxin analysis on leachate samples from Site R. In November, 1981 a USEPA contractor (Ecology and Environment, Inc.) collected leachate and sediment samples at three locations adjacent to the river (Figure R-1). A total of eight samples plus three blanks were collected. Dioxin analysis was performed by the Brehm Laboratory at Wright State University. Monsanto obtained split samples and analyzed for chlorinated dibenzo-p-dioxins (CDDs), select organics, and metals. The USEPA samples were analyzed for tetra through octa CDDs and dibenzofurans (CDFs), select organics, and metals. Table R-12 provides an explanation and cross-reference for samples collected by USEPA and Monsanto.

Analytical results for CDDs and CDFs in the USEPA leachate samples

TABLE R-10: ORGANIC ANALYSIS OF GROUNDWATER SAMPLES FROM SITE R
(COLLECTED BY IEPA ON MARCH 25, 1981)

	SAMPLE LOCATIONS								
PARAMETERS	B-1	B-6S	B-9S	B9D	B11S	B-11D	B-15D	B-17D	B-19D
Aliphatic hydrocarbons					4,000				
Biphenylamine	1,800	250			15,000	1,100	1,300	860	660
Chlorobenzene	3,000	130	720	810	1,000	2,800	2,800	650	300
Chlorophenol	6,600	5,300	11,000	12,000	13,000	3,200	3,200		950
Chloronitrobenzene			2,500	1,500					
Dichlorobenzene	2,600				1,000	800	930	420	360
Dichlorophenol	1,100	700				630	2,900	670	
Trichlorophenol								1,200	

NOTE: All results in ug/l (ppb).
Blanks indicate below detection limit.

TABLE: R-11: ANALYSIS OF LEACHATE AND SEDIMENT SAMPLES FROM SITE R
(COLLECTED OCTOBER 2, 1981 BY IEPA)

PARAMETERS	SAMPLE LOCATIONS					
	SAMPLE A (WATER) D022687	SAMPLE B (WATER) D022688	SAMPLE C (WATER) D022689	SOIL SAMPLE A D022690	SOIL SAMPLE B D022692	SOIL SAMPLE C D022692
PCB			2.6	48	150	230
Toluene	11	40	150			
Chlorobenzene	160	390	1,600			
Chloroaniline	24,000	22,000	38,000	1,700	190	6,900
Chloronitrobenzene	21,000	9,600	820		130	
2,4-D	16,000	17,000	7,800	53	(<5)	(<5)
2,4,5-T				(<5)	(<5)	(<5)
Dichloronitrobenzene	740	590	790			
Dichloroaniline	870	820	2,800			190
Chloronitroaniline	84	33				
Nitroaniline	100	23				
Chlorophenol	15,000	30,000	27,000			290
Phenol	22,000	17,000	12,000			
Methylphenol	570	220	110			
Dichlorophenol	32,000	7,200	2,100	40		
Nitrophenol	600					
Biphenyldiol	1,700					
Aniline	550	120	35			
Methylbenzene	180	2,000	140			
Sucponamide						
4-methyl-2-pentanol	26					
2-methyl cyclopentanol	93					
Biphenyl 2-Ol	300	300	280			310
Benzenesulfonamide	76	630				
Dichlorobenzene		110	250			
Benzoic Acid/Derivatives	12,000	6,600	2,000			
Hydroxybenzoic Acid/ Derivatives	12,000					
2,4-D Isomer	38,000	48,000	29,000			
2,4,5-T Isomer	10,000	12,000	6,500			

NOTE: All results in ppb.
Blanks indicate below detection limits.
( ) indicates values are unconfirmed.

TABLE R-12: COMPILATION OF LEACHATE AND SEDIMENT SAMPLES COLLECTED AT SITE R IN NOVEMBER, 1981

STATION NUMBER	USEPA SAMPLE NUMBER[a]	MONSANTO SAMPLE NUMBER	DESCRIPTION
1	S01	M01	Leachate (5% Sediment)
1	D01		Duplicate for S01
1	S02	M02	Sediment
1	D02		Duplicate for S02
2	S03	M03	Leachate (10% Sediment)
2	S04	M04	Sediment
3	S05	M05	Leachate (10% Sediment
3	S06	M06	Sediment
Blank	S07		City of Chicago tap water. Blank for low level analysis.
Blank	R01		City of Chicago tap water. Blank for medium level analysis.
Blank	R01		City of Chicago tap water. Extra blank for low level analysis.

NOTE: Monsanto did not split samples where no number is listed.
a - Samples collected by Ecology and Environment, Inc.

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are shown in Table R-13. Tetra- and penta-CDDs and CDFS were not detected in any of the samples. However, higher chlorinated dioxins and furans (hexa through octa isomers) were detected in three of the five samples submitted for analysis. Concentrations of these compounds ranged from 4.5 to 2693 parts per trillion (ppt). The two remaining samples, S07 and R01, were water blanks, and showed no detectable CDDs or CDFs. Monsanto also analyzed samples M01 through M05 for CDDs, and results showed no detectable concentrations of these compounds.

Inorganic data for the leachate and sediment samples from Site R are shown in Tables R-14 and R-15. In general, the leachate samples did not show significant inorganic contamination, although concentrations of chromium, copper, boron and iron exceeded water quality standards in two or more samples. Cyanide was detected in several samples, but was also found in the blank. Therefore, the results for cyanide should be considered unreliable. Data for the sediment samples show more substantial evidence of contamination. Elevated levels of arsenic, chromium, copper, lead, and barium were found in several samples. Identified organic compounds in leachate and sediment samples are listed in Table R-16. Phenol and chlorinated phenols were found in all but one sediment sample (M02) at concentrations ranging from 0.2 to 300 ppb. Leachate samples showed elevated levels of several organic parameters, including chlorinated phenols, chlorinated benzenes, chloroanilines, and 2,4-D. As shown in Table R-16, there is a significant discrepancy in the Monsanto and USEPA data for the sediment samples. The values listed by Monsanto were consistently and substantially higher than USEPA values. This may be explained by the fact that USEPA's samples were initially analyzed as medium hazard samples. Because of the higher detection limits associated with this analysis, no contaminants were initially found. USEPA subsequently decided to rerun the samples at lower detection limits. It is possible that the increased holding time and handling of these samples were instrumental in the reduction of concentrations of contaminants found.

Site R was assessed using USEPAs Hazard Ranking System (HRS) model in

TABLE R-13: ANALYSIS OF TETRA THROUGH OCTACHLORINATED DIBENZO-P-DIOXINS AND DIBENZOFURANS IN LEACHATE SAMPLES FROM SITE R (COLLECTED NOVEMBER 12, 1981 BY ECOLOGY AND ENVIRONMENT, INC.)

SAMPLE LOCATIONS	PARAMETERS									
	TCDDs	TCDFs	PCDDs	PCDFs	HXCDDs	HXCDFs	HPCDDs	HPCDFs	OCDDs	OCDFs
S01					4.5	6.3	86	74	323	30
S03					6.3	10	81	182	675	103
S05					5.8	6.3	152	112	2693	53
S07 (Blank)										
R01 (Blank)										

NOTE: All results in parts per trillion (ppb).
Blanks indicate below detection limits.
Analysis performed by Brehm Laboratory, Wright State University.

TABLE R-14: INORGANIC ANALYSIS OF LEACHATE SAMPLES FROM SITE R (COLLECTED NOVEMBER 12, 1981 BY ECOLOGY AND ENVIRONMENT, INC.)

	SAMPLE LOCATIONS							
PARAMETERS	S01	M01	D01	S03	M03	S05	M05	R01
Arsenic	0.034	0.02	0.031	0.016	0.025	0.029	0.065	
Mercury	0.0002		0.0002	0.0002	0.0014	0.0008	0.001	
Selenium	0.038		0.032	0.026		0.031		
Thallium								
Antimony								
Beryllium		0.008			0.005		0.008	
Cadmium		0.006			0.007		0.008	
Chromium	0.04	0.086	0.02	0.015	0.075	0.02	0.07	0.01
Copper		0.073			0.092		0.08	
Lead	0.005		0.008					
Nickel	0.04	0.155			0.124		0.144	
Silver						0.01		
Zinc	0.048	0.216	0.024	0.01	0.216	0.049	0.062	0.31
Aluminum		26.8			30.5		3.22	
Barium		0.5			0.5		0.36	
Boron	19.7	18	17.1	15.35	13.6	21.6	19.1	
Calcium	N/A	368	N/A	N/A	257	N/A	257	N/A
Cobalt		0.03			0.019		0.031	
Iron	0.06	25.5	0.06		30.8	0.63	27.4	
Magnesium	N/A	43.2	N/A	N/A	48.2	N/A	39.8	N/A
Manganese	0.02	6.27	0.32	1.99	2.1	5.4	8.82	0.03
Molybdenum	N/A	0.53	N/A	N/A	0.403	N/A	0.439	N/A
Phosphorus	N/A	0.9	N/A	N/A	0.907	N/A	2.06	N/A
Sodium	N/A	40.4	N/A	N/A	41.8	N/A	44.2	N/A
Tin						0.02	1.4	
Vanadium		0.18			0.138		0.17	
Cyanide	0.071	N/A	0.057	N/A	N/A	N/A	N/A	0.13

NOTE: All Results in ppm.
Blanks indicate below detection limits.
N/A - Parameter not analyzed.
R01 is a water blank.

TABLE R-15: INORGANIC ANALYSIS OF SEDIMENT SAMPLES FROM SITE R (COLLECTED NOVEMBER 12, 1981 BY ECOLOGY AND ENVIRONMENT, INC.)

	SAMPLE LOCATIONS						
PARAMETERS	S02	S03	M02	S04	M04	S06	M06
Arsenic	1.1	2.9	5.3	1.25	9.6	1.8	8.2
Mercury							
Selenium	1.1	1.8		1.5		1.6	
Thallium							
Antimony				4.0			
Beryllium			0.412		0.489		1.03
Cadmium			0.747	0.61	1.04		2.49
Chromium			10.7		10.4		28.7
Copper			7.17		7.89		25.5
Lead	2.4	2.9		2.45		1.7	
Nickel			17.4		18.6		33.8
Zinc	9.5	10	29.5	6.8	36.3	9.2	69.4
Aluminum	150	190	3870	155	4380	170	13,900
Barium			75.4		130	20	7.79
Boron		25	53	17	28.7	26	30.3
Calcium	N/A	N/A	3660	N/A	4010	N/A	6590
Cobalt			4.7		4.8		9.45
Iron	580	660	5870	425	8660	580	12,600
Magnesium	N/A	N/A	1780	N/A	2090	N/A	4080
Manganese	76	46	79.7	42	119	47	273
Molybdenum	N/A	N/A	10.6	N/A	12.5	N/A	22.4
Phosphorus	N/A	N/A	154	N/A	270	N/A	366
Sodium	N/A	N/A	1840	N/A	1270	N/A	4720
Tin							
Vanadium			14.4		17		43.9
Cyanide	28	13	N/A	6.8	N/A	90	N/A

NOTE: All results in ppm.
Blanks indicate below detection limit.
N/A - Parameter not analyzed.

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TABLE R-16: IDENTIFIED ORGANIC COMPOUNDS IN LEACHATE
AND SEDIMENT SAMPLES FROM SITE R
(COLLECTED NOVEMBER 12, 1981 BY ECOLOGY AND ENVIRONMENT, INC.)

	SAMPLE LOCATIONS								
	LEACHATE			SEDIMENT					
PARAMETERS	MO1	MO3	MO5	SO2	MO2	SO4	MO4	SO6	MO6
2-Chlorophenol	340	100		0.26		0.2	200	0.4	
2,4-Dichlorophenol	100					0.42		0.56	
Phenol	130					0.5	300	0.42	300
2,4,6-Trichlorophenol								0.32	
1,4-Dichlorobenzene	30				200		400		600
1,2-Dichlorobenzene	20								
Bis(2 ethylhexyl) Phthalate					400		300		400
Chlorobenzene	160	30							
Aniline	60	40	25						
Chloroanilines	8000	4000	600						
Dichloroanilines	100	40							200
Chloronitrobenzenes	3000	80							
2,4-D	332	100							
PCBs			0.008		0.014		0.034		0.192

NOTE: All results in parts per billion (ppb).
Blanks indicate below detection limit.

July, 1982 by Ecology & Environment, Inc. The final migration score assigned to the site was 7.23, which included observed releases for both the ground water and surface water routes. Route scores for ground water and surface water were 6.12 and 10.91 respectively. The air route was assigned a zero score because an observed release had not been documented. The reason for the relatively low final score for Site R is the lack of a target population, which is a major factor in the HRS model. The source of potable water in the area is an intake in the Mississippi River, located approximately 2.5 miles upstream from the site. The upstream location of the intake excludes it from being used in the model.

In 1982, the Illinois Attorney General's office filed suit (Complaint Number 82-CH-185) against Monsanto outlining several apparent violations of the Illinois Environmental Protection Act. For the most part, the Complaint was directed at alleged water pollution caused by the defendant. Relief requested by the Attorney General included civil penalties and issuance of an injunction directing the defendant to immediately prevent seepage of wastes into the Mississippi River, and to remove all such wastes from the property. To date, no information has been located concerning a determination in this case. The Attorney General's office is presently engaged in an ongoing suit against Monsanto in an attempt to have all wastes removed from the site.

USEPA file information suggests that fish studies have been conducted in the Mississippi River in the vicinity of Site R. The Food and Drug Administration (FDA) in Edwardsville, Illinois has found unacceptable concentrations of PCBs in fish collected downstream of Site R. A detailed study was proposed for the area in the immediate vicinity of the site, however, attempts to obtain data from this study have been unsuccessful to date. It is not known if this study was to have included an assessment of the Sauget Treatment Plant effluent, which is discharged immediately northwest of Site R.

In 1982, USEPA developed a comparative analysis of chemicals

detected in monitoring wells and leachate samples from Site R as they relate to wastes reported by Monsanto to have been disposed of at the site. Also included in the analysis were chemicals reported as being manufactured at Monsanto's Krummrich Plant, as documented in the 1977 chemical inventory developed as a result of the Toxic Substances Control Act (TSCA) and the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). The analysis revealed a high degree of association or correlation betweer chemicals detected in t!e sample, and those reported to have been disposed of or manufactured by Monsanto. A summary of data from this USEPA analysis report is presented in Table R-17.

In 1984, Monsanto contracted Geraghty and Miller, Inc. to perform a detailed hydrogeologic investigation in the Sauget area. Data from this study, which included the installation of approximately 60 monitoring wells, have not been made available.

Data Assessment and Recommendations

A great deal of data has been developed to date for Site R. Organic contaminants have been detected in both shallow and deep monitoring wells on site, as well as in leachate seeps leaving the site. Evidence of contamination has been observed to a depth of approximately 60 feet in soil borings. A substantial listing of the types and quantities of chemical wastes disposed of at the site was submitted to IEPA by Monsanto. In view of this information the only significant data gaps are: (1) specific delineation of contaminant boundaries, and (2) determination of the presence or absence of air emissions from the site. Because of the permeable nature of the subsurface soils and the characteristics of the wastes present at the site, it is likely that extensive migration of contaminants has occurred.

The present scope of work for the Dead Creek Project includes installation and sampling of monitoring wells at Site R. Ambient air monitoring will also be conducted to determine to what extent, if any, off-gassing of organic contaminants is occurring. Every effort

TABLE R-17: COMPARATIVE ANALYSIS OF CHEMICALS DETECTED IN SAMPLES AT SITE R AND THOSE REPORTED TO HAVE BEEN DISPOSED OR MANUFACTURED BY MONSANTO

COMPOUNDS	LEACHATE/SEDIMENT ANALYSIS			GROUNDWATER ANALYSIS	REPORTED DISPOSAL	MANUFACTURED
	IEPA	MONSANTO	USEPA	IEPA	MONSANTO	MONSANTO
PCBs	X	X				X
Chlorobenzene	X	X		X	X	X
Dichlorobenzene	X	X		X		X
Chloroaniline	X	X			X	X
Chloronitrobenzene	X	X		X	X	X
Dichloronitrobenzene	X					
Chlorophenol	X	X	X	X	X	X
Dichlorophenol	X	X	X	X	X	X
2,4-D/isomers	X	X				X
2,4,5,-T/isomers	X					X
Aniline	X	X				
Dichloroaniline	X				X	
Chloronitroaniline	X				X	X
Nitroaniline	X				X	X
Phenol	X	X	X	X	X	
Nitrophenol	X					
Methylphenol	X					
Diphenyldiol	X					
Benzoic Acid/Derivatives	X				X	X
4-methyl-2-pentanol	X				X	
2-methylcyclopentanol	X				X	
Benzene Sulfonamide	X				X	
Chlorotoluene	X					X
Dioxins/Dibenzofurans			X		X (By Product)	X (By Product)

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should be made by th IEPA to obtain data on, and gain access to, the Monsanto wells installed by Geraghty and Miller. Access to these wells would likely eliminate the need for, or at least affect the location of, the monitoring wells to be installed during the field investigation of Site R. Pending the results of ground water sampling, a more specific approach to delineating the extent of contamination could be proposed. Samples should initially be collected from a minimum of 8 wells on Site R, and hydraulic conductivity tests should be run on a minimum of 2 deep and 2 shallow wells. Possibilities for identifying plume characteristics include conducting electromagenetic surveys (including off site areas), and soil gas monitoring. In any event, the lateral and vertical extent of contaminantion must be addressed prior to design of remedial options.

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Exhibit 9

EMP_ID	Well_ID	Lab_ID	Col_date	Analyte	Result	Units	RDL	Comment
B-21B_5/10/00_NM	B-21B		5/10/2000	4-Chloroaniline	16000	ug/l		Solutia, 8/2000
B-22A_5/10/00_NM	B-22A		5/10/2000	4-Chloroaniline	0	ug/l	10000	Solutia, 8/2000
B-24A_2/15/86_NM	B-24A		2/15/1986	4-Chloroaniline	5820	ug/l		EEI 1998. Source is G&M 1994.
B-24A_5/11/00_NM	B-24A		5/11/2000	4-Chloroaniline	0	ug/l	80000	Solutia, 8/2000
B-24C_5/11/00_DUP	B-24C	B-24D	5/11/2000	4-Chloroaniline	0	ug/l	40000	Solutia, 8/2000
B-24C_5/11/00_NM	B-24C		5/11/2000	4-Chloroaniline	0	ug/l	20000	Solutia, 8/2000
B-25A_3/15/87_NM	B-25A		3/15/1987	4-Chloroaniline	5380	ug/l		EEI 1998. Source is G&M 1990.
B-25A_3/25/87_NM	B-25A	DC-GW-49	3/25/1987	4-Chloroaniline	0	ug/l		Need RDL; Source is EEI 1988.
B-25A_5/10/00_NM	B-25A		5/10/2000	4-Chloroaniline	0	ug/l	400000	Solutia, 8/2000
B-25B_5/10/00_NM	B-25B		5/10/2000	4-Chloroaniline	0	ug/l	50000	Solutia, 8/2000
B-26A_3/15/87_NM	B-26A		3/15/1987	4-Chloroaniline	710	ug/l		EEI 1998. Source is G&M 1990.
B-26A_3/25/87_DUP	B-26A	GW-48	3/25/1987	4-Chloroaniline	540	ug/l		EEI 1998. Source is G&M 1990.
B-26A_3/25/87_NM	B-26A	GW-47	3/25/1987	4-Chloroaniline	680	ug/l		EEI 1998. Source is G&M 1990.
B-26A_5/11/00_NM	B-26A		5/11/2000	4-Chloroaniline	1900	ug/l		Solutia, 8/2000
B-26B_5/11/00_NM	B-26B		5/11/2000	4-Chloroaniline	35000	ug/l		Solutia, 8/2000
B-28A_3/15/87_NM	B-28A		3/15/1987	4-Chloroaniline	0	ug/l	11	EEI 1998. Source is G&M 1990.
B-28A_3/25/87_NM	B-28A	DC-GW-45	3/25/1987	4-Chloroaniline	0	ug/l		Need RDL; Source is EEI 1988.
B-28A_5/10/00_NM	B-28A		5/10/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
B-28B_5/10/00_NM	B-28B		5/10/2000	4-Chloroaniline	71000	ug/l		Solutia, 8/2000
B-29A_5/10/00_DUP	B-29A		5/10/2000	4-Chloroaniline	0	ug/l	80000	Solutia, 8/2000
B-29A_5/10/00_NM	B-29A		5/10/2000	4-Chloroaniline	0	ug/l	200000	Solutia, 8/2000
B-29B_5/10/00_NM	B-29B		5/10/2000	4-Chloroaniline	0	ug/l	100000	Solutia, 8/2000
BBU-B52_1/15/00_NM	BBU-B52		1/15/2000	4-Chloroaniline	80	ug/l		Solutia, 8/2000
BBU-B53_1/15/00_NM	BBU-B53		1/15/2000	4-Chloroaniline	0	ug/l		Solutia, 8/2000
BBU-B54_1/15/00_NM	BBU-B54		1/15/2000	4-Chloroaniline	0	ug/l		Solutia, 8/2000
BBU-B55_1/15/00_NM	BBU-B55		1/15/2000	4-Chloroaniline	240	ug/l		Solutia, 8/2000
BBU-B56_1/15/00_NM	BBU-B56		1/15/2000	4-Chloroaniline	530	ug/l		Solutia, 8/2000
BBU-B57_1/15/00_NM	BBU-B57		1/15/2000	4-Chloroaniline	870	ug/l		Solutia, 8/2000
BBU-B58_1/15/00_NM	BBU-B58		1/15/2000	4-Chloroaniline	860	ug/l		Solutia, 8/2000
BBU-B59_1/15/00_NM	BBU-B59		1/15/2000	4-Chloroaniline	370	ug/l		Solutia, 8/2000
CA-3_2/2/00_DUP	CA-3	DUP-3	2/2/2000	4-Chloroaniline	0	ug/l	800	Solutia, 8/2000
DW-34_1/26/00_NM	DW-34		1/26/2000	4-Chloroaniline	0	ug/l	100	Solutia, 8/2000
EE-01_3/17/87_NM	EE-01	DC-GW-10	3/17/1987	4-Chloroaniline	6400	ug/l		EEI 1998; Source is EEI 1988.
EE-02_3/17/87_NM	EE-02	DC-GW-11	3/17/1987	4-Chloroaniline	810	ug/l		EEI 1998; Source is EEI 1988.
EE-03_3/17/87_NM	EE-03	DC-GW-12	3/17/1987	4-Chloroaniline	200	ug/l		EEI 1998; Source is EEI 1988.
EE-04_3/17/87_NM	EE-04	DC-GW-13	3/17/1987	4-Chloroaniline	0	ug/l		EEI 1998; Source is EEI 1988.
EE-05_3/18/87_NM	EE-05	DC-GW-21	3/18/1987	4-Chloroaniline	0	ug/l		EEI 1998; Source is EEI 1988.
EE-06_3/16/87_NM	EE-06	DC-GW-01	3/16/1987	4-Chloroaniline	120	ug/l		Need RDL; Source is EEI 1988.
EE-07_3/16/87_NM	EE-07	DC-GW-02	3/16/1987	4-Chloroaniline	0	ug/l		Need RDL; Source is EEI 1988.
EE-08_3/16/87_NM	EE-08	DC-GW--06	3/16/1987	4-Chloroaniline	0	ug/l		Need RDL; Source is EEI 1988.
EE-09_3/16/87_NM	EE-09	DC-GW-03	3/16/1987	4-Chloroaniline	0	ug/l		Need RDL; Source is EEI 1988.
EE-10_3/16/87_NM	EE-10	DC-GW-04	3/16/1987	4-Chloroaniline	0	ug/l		Need RDL; Source is EEI 1988.
EE-11_3/24/87_NM	EE-11	DC-GW-32	3/24/1987	4-Chloroaniline	15000	ug/l		EEI 1998; Source is EEI 1988.
EE-12_3/23/87_DUP	EE-12	DC-GW-29	3/23/1987	4-Chloroaniline	78	ug/l		EEI 1998; Source is EEI 1988.
EE-12_3/23/87_NM	EE-12	DC-GW-24	3/23/1987	4-Chloroaniline	140	ug/l		EEI 1998; Source is EEI 1988.
EE-13_3/23/87_NM	EE-13	DC-GW-23	3/23/1987	4-Chloroaniline	0	ug/l		EEI 1998; Source is EEI 1988.
EE-14_3/23/87_NM	EE-14	DC-GW-26	3/23/1987	4-Chloroaniline	8300	ug/l		EEI 1998; Source is EEI 1988.
EE-15_3/23/87_NM	EE-15	DC-GW-27	3/23/1987	4-Chloroaniline	18	ug/l		EEI 1998; Source is EEI 1988.
EE-16_3/23/87_NM	EE-16	DC-GW-28	3/23/1987	4-Chloroaniline	9600	ug/l		EEI 1998; Source is EEI 1988.
EE-17_3/16/87_NM	EE-17	DC-GW-05	3/16/1987	4-Chloroaniline	0	ug/l		Need RDL; Source is EEI 1988.
EE-18_3/16/87_NM	EE-18	DC-GW-09	3/16/1987	4-Chloroaniline	4400	ug/l		Need RDL; Source is EEI 1988.
EE-19_3/16/87_DUP	EE-19	DC-GW-08	3/16/1987	4-Chloroaniline	15000	ug/l		Need RDL; Source is EEI 1988.

SAMP_ID	Well_ID	Loc_ID	Collect_Date	Analyte	Result	Units	RDL	Comment
EE-19_3/16/87_NM	EE-19	DC-GW-07	3/16/1987	4-Chloroaniline	14000	ug/l		Need RDL. Source is EEI 1988.
EE-20_3/23/87_NM	EE-20	DC-GW-31	3/23/1987	4-Chloroaniline	0	ug/l		EEI 1998; Source is EEI 1988.
EE-21_3/24/87_NM	EE-21	DC-GW-38	3/24/1987	4-Chloroaniline	0	ug/l	11	Source is EEI 1988.
EE-21_7/14/87_NM	EE-21	DC-GW-38A	7/14/1987	4-Chloroaniline	0	ug/l	10	Source is EEI 1988.
EE-22_3/24/87_NM	EE-22	DC-GW-39	3/24/1987	4-Chloroaniline	0	ug/l	2200	Discrepency in EEI 1998; Source is EEI 1988.
EE-22_7/14/87_NM	EE-22	DC-GW-39A	7/14/1987	4-Chloroaniline	0	ug/l		Discrepency in EEI 1998; Source is EEI 1988.
EE-23_3/24/87_NM	EE-23	DC-GW-40	3/24/1987	4-Chloroaniline	0	ug/l	11	Source is EEI 1988.
EE-23_7/14/87_NM	EE-23	DC-GW-40A	7/14/1987	4-Chloroaniline	0	ug/l	11	Source is EEI 1988.
EE-24_3/24/87_DUP	EE-24	DC-GW-42	3/24/1987	4-Chloroaniline	0	ug/l	11	Source is EEI 1988.
EE-24_3/24/87_NM	EE-24	DC-GW-41	3/24/1987	4-Chloroaniline	0	ug/l	11	Source is EEI 1988.
EE-24_5/9/00_NM	EE-24		5/9/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
EE-24_7/14/87_NM	EE-24	DC-GW-41A	7/14/1987	4-Chloroaniline	0	ug/l	10	Source is EEI 1988.
EE-25_3/24/87_NM	EE-25	DC-GW-43	3/24/1987	4-Chloroaniline	0	ug/l	11	Source is EEI 1988.
EE-25_7/14/87_NM	EE-25	DC-GW-43A	7/14/1987	4-Chloroaniline	0	ug/l	10	Source is EEI 1988.
FB-1_5/9/00_NM	FB-1		5/9/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
FB-2_5/10/00_NM	FB-2		5/10/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
G101(99)_5/24/99_NM	G101(99)		5/24/1999	4-Chloroaniline	0	ug/l		IEPA, March 2000 Trip Report
G101_3/17/87_NM	G101	DC-GW-14	3/17/1987	4-Chloroaniline	0	ug/l		EEI 1998; Source is EEI 1988.
G102(99)_5/24/99_NM	G102(99)		5/24/1999	4-Chloroaniline	1000	ug/l		IEPA, March 2000 Trip Report
G102(K)_5/10/99_NM	G102(K)		5/10/1999	4-Chloroaniline	12	ug/l		Solutia, 8/2000
G102_3/24/87_NM	G102	DC-GW-34	3/24/1987	4-Chloroaniline	0	ug/l		EEI 1998; Source is EEI 1988.
G102_7/14/87_NM	G102	DC-GW-34A	7/14/1987	4-Chloroaniline	0	ug/l		EEI 1998; Source is EEI 1988.
G103(99)_5/24/99_NM	G103(99)		5/24/1999	4-Chloroaniline	0	ug/l		IEPA, March 2000 Trip Report
G103(K)_5/10/99_NM	G103(K)		5/10/1999	4-Chloroaniline	2	ug/l		Solutia, 8/2000
G103_3/17/87_NM	G103	DC-GW-15	3/17/1987	4-Chloroaniline	0	ug/l		EEI 1998; Source is EEI 1988.
G104(99)_5/26/99_NM	G104(99)		5/26/1999	4-Chloroaniline	4500	ug/l		IEPA, March 2000 Trip Report
G104(K)_5/11/99_NM	G104(K)		5/11/1999	4-Chloroaniline	86	ug/l		Solutia, 8/2000
G104_3/17/87_NM	G104	DC-GW-16	3/17/1987	4-Chloroaniline	0	ug/l		EEI 1998; Source is EEI 1988.
G105(K)_5/11/99_NM	G105(K)		5/11/1999	4-Chloroaniline	0	ug/l		Solutia, 8/2000
G106(99)_5/27/99_NM	G106(99)		5/27/1999	4-Chloroaniline	0	ug/l		IEPA, March 2000 Trip Report
G106(K)_5/11/99_DUP	G106(K)	G116(K)	5/11/1999	4-Chloroaniline	0.7	ug/l		Solutia, 8/2000
G106(K)_5/11/99_NM	G106(K)		5/11/1999	4-Chloroaniline	0.7	ug/l		Solutia, 8/2000
G106_3/24/87_NM	G106	DC-GW-33	3/24/1987	4-Chloroaniline	110	ug/l		EEI 1998; Source is EEI 1988.
G107(99)_5/27/99_NM	G107(99)		5/27/1999	4-Chloroaniline	0	ug/l		IEPA, March 2000 Trip Report
G107(K)_5/12/99_NM	G107(K)		5/12/1999	4-Chloroaniline	0	ug/l		Solutia, 8/2000
G107_3/18/87_DUP	G107	DC-GW-20	3/18/1987	4-Chloroaniline	0	ug/l		EEI 1998; Source is EEI 1988.
G107_3/18/87_NM	G107	DC-GW-19	3/18/1987	4-Chloroaniline	0	ug/l		EEI 1998; Source is EEI 1988.
G108(99)_5/25/99_NM	G108(99)		5/25/1999	4-Chloroaniline	0	ug/l		IEPA, March 2000 Trip Report
G108(K)_5/11/99_NM	G108(K)		5/11/1999	4-Chloroaniline	150	ug/l		Solutia, 8/2000
G108_3/18/87_NM	G108	DC-GW-18	3/18/1987	4-Chloroaniline	0	ug/l		EEI 1998. Source is EEI 1988.
G109(99)_5/27/99_NM	G109(99)		5/27/1999	4-Chloroaniline	0	ug/l		IEPA, March 2000 Trip Report
G109(K)_5/12/99_NM	G109(K)		5/12/1999	4-Chloroaniline	250	ug/l		Solutia, 8/2000
G109_3/24/87_NM	G109	DC-GW-37	3/24/1987	4-Chloroaniline	60	ug/l		EEI 1998. Source is EEI 1988.
G110(99)_5/26/99_NM	G110(99)		5/26/1999	4-Chloroaniline	0	ug/l		IEPA, March 2000 Trip Report
G110(K)_5/13/99_NM	G110(K)		5/13/1999	4-Chloroaniline	0	ug/l		Solutia, 8/2000
G110_3/24/87_NM	G110	DC-GW-36	3/24/1987	4-Chloroaniline	30	ug/l		EEI 1998; Source is EEI 1988.
G111(99)_5/24/99_NM	G111(99)		5/24/1999	4-Chloroaniline	0	ug/l		IEPA, March 2000 Trip Report
G111(K)_5/12/99_NM	G111(K)		5/12/1999	4-Chloroaniline	0	ug/l		Solutia, 8/2000
G112(99)_5/25/99_NM	G112(99)		5/25/1999	4-Chloroaniline	0	ug/l		IEPA, March 2000 Trip Report
G112(K)_5/13/99_NM	G112(K)		5/13/1999	4-Chloroaniline	0	ug/l		Solutia, 8/2000
G112_3/23/87_NM	G112		3/23/1987	4-Chloroaniline	14	ug/l		EEI 1998; Source is EEI 1988.
G113(99)_5/25/99_NM	G113(99)		5/25/1999	4-Chloroaniline	0	ug/l		IEPA, March 2000 Trip Report

SAMP_ID	Well_ID	Lab_ID	Coll_Date	Analyte	Result	Units	RDL	Comment
G113(K)_5/13/99_NM	G113(K)		5/13/1999	4-Chloroaniline	0	ug/l		Solutia, 8/2000
G114(99)_5/25/99_DUP	G114(99)	G115(99)	5/25/1999	4-Chloroaniline	0	ug/l		IEPA, March 2000 Trip Report
G114(99)_5/25/99_NM	G114(99)		5/25/1999	4-Chloroaniline	0	ug/l		IEPA, March 2000 Trip Report
G114(K)_5/12/99_NM	G114(K)		5/12/1999	4-Chloroaniline	0	ug/l		Solutia, 8/2000
G115(K)_5/12/99_NM	G115(K)		5/12/1999	4-Chloroaniline	0	ug/l		Solutia, 8/2000
G116(99)_5/26/99_NM	G116(99)		5/26/1999	4-Chloroaniline	1000	ug/l		IEPA, March 2000 Trip Report
G117(99)_5/27/99_NM	G117(99)		5/27/1999	4-Chloroaniline	0	ug/l		IEPA, March 2000 Trip Report
GM-106_11/15/91_NM	GM-106		11/15/1991	4-Chloroaniline	19900	ug/l		EEI 1998. Source is G&M 1994.
GM-106_6/8/92_DUP	GM-106		6/8/1992	4-Chloroaniline	40000	ug/l		EEI 1998. Source is G&M 1994.
GM-106_6/8/92_NM	GM-106		6/8/1992	4-Chloroaniline	160000	ug/l		EEI 1998. Source is G&M 1994.
GM-10B_2/2/00_NM	GM-10B		2/2/2000	4-Chloroaniline	0	ug/l	200	Solutia, 8/2000
GM-13_2/1/00_NM	GM-13		2/1/2000	4-Chloroaniline	0	ug/l	37000000	Solutia, 8/2000
GM-14_2/3/00_NM	GM-14		2/3/2000	4-Chloroaniline	21000	ug/l		Solutia, 8/2000
GM-15_2/2/00_NM	GM-15		2/2/2000	4-Chloroaniline	0	ug/l	200	Solutia, 8/2000
GM-17A_1/31/00_NM	GM-17A		1/31/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GM-17B_1/31/00_NM	GM-17B		1/31/2000	4-Chloroaniline	27	ug/l		Solutia, 8/2000
GM-18A_1/28/00_NM	GM-18A		1/28/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GM-18A_5/8/00_NM	GM-18A		5/8/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GM-18B_1/28/00_NM	GM-18B		1/28/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GM-18B_5/8/00_NM	GM-18B		5/8/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GM-19A_5/9/00_NM	GM-19A		5/9/2000	4-Chloroaniline	0	ug/l	160	Solutia, 8/2000
GM-19B_5/9/00_NM	GM-19B		5/9/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GM-19C_5/9/00_NM	GM-19C		5/9/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GM-19D_5/9/00_NM	GM-19D		5/9/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GM-2_2/3/00_NM	GM-2		2/3/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GM-20B_2/1/00_DUP	GM-20B	DUP-2	2/1/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GM-20B_2/1/00_NM	GM-20B		2/1/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GM-20B_5/9/00_NM	GM-20B		5/9/2000	4-Chloroaniline	0	ug/l	100	Solutia, 8/2000
GM-23_5/9/00_NM	GM-23		5/9/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GM-27B_11/15/91_NM	GM-27B		11/15/1991	4-Chloroaniline	31600	ug/l		EEI 1998. Source is G&M 1994.
GM-27B_5/10/00_NM	GM-27B		5/10/2000	4-Chloroaniline	25000	ug/l		Solutia, 8/2000
GM-27B_6/9/92_NM	GM-27B		6/9/1992	4-Chloroaniline	1000000	ug/l		EEI 1998. Source is G&M 1994.
GM-27C_11/15/91_NM	GM-27C		11/15/1991	4-Chloroaniline	12500	ug/l		EEI 1998. Source is G&M 1994.
GM-27C_6/9/92_NM	GM-27C		6/9/1992	4-Chloroaniline	49000	ug/l		EEI 1998. Source is G&M 1994.
GM-28B_11/15/91_NM	GM-28B		11/15/1991	4-Chloroaniline	53100	ug/l		Need RDL; EEI 1998. Source is G&M 1994.
GM-28B_3/15/89_NM	GM-28B		3/15/1989	4-Chloroaniline	113000	ug/l		EEI 1998. Source is G&M 1990.
GM-28B_6/5/92_NM	GM-28B		6/5/1992	4-Chloroaniline	320000	ug/l		EEI 1998. Source is G&M 1994.
GM-28C_11/15/91_NM	GM-28C		11/15/1991	4-Chloroaniline	51900	ug/l		EEI 1998. Source is G&M 1994.
GM-28C_3/15/89_DUP	GM-28C		3/15/1989	4-Chloroaniline	251000	ug/l		EEI 1998. Source is G&M 1990.
GM-28C_3/15/89_NM	GM-28C		3/15/1989	4-Chloroaniline	220000	ug/l		EEI 1998. Source is G&M 1990.
GM-28C_6/8/92_NM	GM-28C		6/8/1992	4-Chloroaniline	2300000	ug/l		EEI 1998. Source is G&M 1994.
GM-29_2/3/00_NM	GM-29		2/3/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2001
GM-3_1/27/00_NM	GM-3		1/27/2000	4-Chloroaniline	0	ug/l	5	Solutia, 8/2001
GM-31A_1/28/00_NM	GM-31A		1/28/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GM-31B_1/28/00_NM	GM-31B		1/28/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GM-32_2/2/00_NM	GM-32		2/2/2000	4-Chloroaniline	0	ug/l	100	Solutia, 8/2000
GM-33_2/1/00_NM	GM-33		2/1/2000	4-Chloroaniline	63	ug/l		Solutia, 8/2000
GM-34_2/1/00_NM	GM-34		2/1/2000	4-Chloroaniline	0	ug/l	200	Solutia, 8/2000
GM-35_2/1/00_NM	GM-35		2/1/2000	4-Chloroaniline	320	ug/l		Solutia, 8/2000
GM-36_2/1/00_NM	GM-36		2/1/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GM-37_2/1/00_NM	GM-37		2/1/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GM-38_1/25/00_NM	GM-38		1/25/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000

SAMP_ID	YAN_ID	Lab_ID	Coll_date	Analyte	Result	Units	ROL	Comment
GM-4A_1/26/00_NM	GM-4A	GM-4AR	1/26/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GM-4B_1/26/00_NM	GM-4B		1/26/2000	4-Chloroaniline	53	ug/l		Solutia, 8/2000
GM-5_1/28/00_NM	GM-5		1/28/2000	4-Chloroaniline	0	ug/l	5	Solutia, 8/2000
GM-54A_2/1/00_NM	GM-54A		2/1/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GM-54A_5/8/00_NM	GM-54A		5/8/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GM-54B_2/1/00_NM	GM-54B		2/1/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GM-54B_5/11/00_NM	GM-54B		5/11/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GM-55C_11/15/91_NM	GM-55C		11/15/1991	4-Chloroaniline	17200	ug/l		EEI 1998. Source is G&M 1994.
GM-55C_6/8/92_NM	GM-55C		6/8/1992	4-Chloroaniline	9400	ug/l		EEI 1998. Source is G&M 1994.
GM-56C_11/15/91_NM	GM-56C		11/15/1991	4-Chloroaniline	56900	ug/l		EEI 1998. Source is G&M 1994.
GM-56C_5/11/00_NM	GM-56C		5/11/2000	4-Chloroaniline	0	ug/l	2000	Solutia, 8/2000
GM-56C_6/5/92_NM	GM-56C		6/5/1992	4-Chloroaniline	62000	ug/l		EEI 1998. Source is G&M 1994.
GM-57C_11/15/91_DUP	GM-57C		11/15/1991	4-Chloroaniline	44300	ug/l		EEI 1998. Source is G&M 1994.
GM-57C_11/15/91_NM	GM-57C		11/15/1991	4-Chloroaniline	26200	ug/l		EEI 1998. Source is G&M 1994.
GM-57C_6/5/92_NM	GM-57C		6/5/1992	4-Chloroaniline	27000	ug/l		EEI 1998. Source is G&M 1994.
GM-59A_1/31/00_NM	GM-59A		1/31/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GM-60A_5/8/00_NM	GM-60A		5/8/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GM-60B_5/9/00_NM	GM-60B		5/9/2000	4-Chloroaniline	0	ug/l		Solutia, 8/2000
GM-60B_5/9/00_NM	GM-60C		5/9/2000	4-Chloroaniline	0	ug/l	80	Solutia, 8/2000
GM-62A_11/15/89_NM	GM-62A		11/15/1989	4-Chloroaniline	0	ug/l	12	EEI 1998. Source is G&M 1994.
GM-62A_6/10/92_NM	GM-62A		6/10/1992	4-Chloroaniline	0	ug/l		EEI 1998. Source is G&M 1994.
GM-62B_11/15/89_NM	GM-62B		11/15/1989	4-Chloroaniline	0	ug/l	11	EEI 1998. Source is G&M 1994.
GM-62B_6/9/92_DUP	GM-62B		6/9/1992	4-Chloroaniline	5	ug/l		EEI 1998. Source is G&M 1994.
GM-62B_6/9/92_NM	GM-62B		6/9/1992	4-Chloroaniline	19	ug/l		EEI 1998. Source is G&M 1994.
GM-62C_11/15/89_NM	GM-62C		11/15/1989	4-Chloroaniline	0	ug/l	11	EEI 1998. Source is G&M 1994.
GM-62C_6/9/92_NM	GM-62C		6/9/1992	4-Chloroaniline	0	ug/l		EEI 1998. Source is G&M 1994.
GM-65A_6/10/92_NM	GM-65A		6/10/1992	4-Chloroaniline	0	ug/l		EEI 1998. Source is G&M 1994.
GM-66A_6/11/92_NM	GM-66A		6/11/1992	4-Chloroaniline	0	ug/l		EEI 1998. Source is G&M 1994.
GM-66B_6/11/92_NM	GM-66B		6/11/1992	4-Chloroaniline	0	ug/l		EEI 1998. Source is G&M 1994.
GM-66C_6/10/92_DUP	GM-66C		6/10/1992	4-Chloroaniline	0	ug/l		EEI 1998. Source is G&M 1994.
GM-66C_6/10/92_NM	GM-66C		6/10/1992	4-Chloroaniline	0	ug/l		EEI 1998. Source is G&M 1994.
GM-6A_1/26/00_NM	GM-6A		1/26/2000	4-Chloroaniline	0	ug/l	5	Solutia, 8/2000
GM-6B_1/26/00_DUP	GM-6B	DUP-1	1/26/2000	4-Chloroaniline	190	ug/l		Solutia, 8/2000
GM-6B_1/26/00_NM	GM-6B		1/26/2000	4-Chloroaniline	290	ug/l		Solutia, 8/2000
GM-7_1/25/00_NM	GM-7		1/25/2000	4-Chloroaniline	0	ug/l	5	Solutia, 8/2000
GM-8_1/31/00_NM	GM-8		1/31/2000	4-Chloroaniline	0	ug/l	5	Solutia, 8/2000
GM-9A_2/1/00_NM	GM-9A		2/1/2000	4-Chloroaniline	0	ug/l	5	Solutia, 8/2000
GM-9B_2/1/00_NM	GM-9B		2/1/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GP-10A_1/28/00_NM	GP-10A		1/28/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GP-10B_1/28/00_NM	GP-10B		1/28/2000	4-Chloroaniline	0	ug/l	40	Solutia, 8/2000
GP-11A_1/28/00_NM	GP-11A		1/28/2000	4-Chloroaniline	0	ug/l	80	Solutia, 8/2000
GP-11B_1/28/00_NM	GP-11B		1/28/2000	4-Chloroaniline	110	ug/l		Solutia, 8/2000
GP-12A_1/31/00_NM	GP-12A		1/31/2000	4-Chloroaniline	0	ug/l	400	Solutia, 8/2000
GP-12B_1/31/00_NM	GP-12B		1/31/2000	4-Chloroaniline	0	ug/l	100	Solutia, 8/2000
GP-13A_1/31/00_NM	GP-13A		1/31/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GP-13B_1/31/00_NM	GP-13B		1/31/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GP-14A_2/1/00_NM	GP-14A		2/1/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GP-14B_2/1/00_NM	GP-14B		2/1/2000	4-Chloroaniline	110	ug/l		Solutia, 8/2000
GP-15A_2/1/00_NM	GP-15A		2/1/2000	4-Chloroaniline	2600	ug/l		Solutia, 8/2000
GP-15B_2/1/00_NM	GP-15B		2/1/2000	4-Chloroaniline	92000	ug/l		Solutia, 8/2000
GP-16A_2/1/00_NM	GP-16A		2/1/2000	4-Chloroaniline	1600	ug/l		Solutia, 8/2000
GP-16B_2/1/00_NM	GP-16B		2/1/2000	4-Chloroaniline	1500	ug/l		Solutia, 8/2000

SAMP_ID	Well_ID	Lab_ID	Col_date	Analyte	Result	Units	RDL	Comment
GP-17A_2/2/00_NM	GP-17A		2/2/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GP-17B_2/2/00_NM	GP-17B		2/2/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GP-18A_2/3/00_NM	GP-18A		2/3/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GP-18B_2/3/00_NM	GP-18B		2/3/2000	4-Chloroaniline	0	ug/l	80	Solutia, 8/2000
GP-19A_2/3/00_NM	GP-19A		2/3/2000	4-Chloroaniline	0	ug/l	10000	Solutia, 8/2000
GP-19B_2/3/00_NM	GP-19B		2/3/2000	4-Chloroaniline	0	ug/l	10000	Solutia, 8/2000
GP-1A_1/26/00_NM	GP-1A		1/26/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GP-1B_1/25/00_NM	GP-1B		1/25/2000	4-Chloroaniline	63	ug/l		Solutia, 8/2000
GP-20A_2/3/00_NM	GP-20A		2/3/2000	4-Chloroaniline	0	ug/l	100	Solutia, 8/2000
GP-20B_2/3/00_NM	GP-20B		2/3/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GP-2B_1/25/00_NM	GP-2B		1/25/2000	4-Chloroaniline	93	ug/l		Solutia, 8/2000
GP-3A_1/26/00_NM	GP-3A		1/26/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GP-3B_1/26/00_NM	GP-3B		1/26/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GP-4A_1/26/00_NM	GP-4A		1/26/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GP-4B_1/26/00_NM	GP-4B		1/26/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GP-5A_1/26/00_NM	GP-5A		1/26/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GP-6A_1/26/00_NM	GP-6A		1/27/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GP-6B_1/27/00_NM	GP-6B		1/27/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GP-7A_1/27/00_NM	GP-7A		1/27/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GP-7B_1/27/00_NM	GP-7B		1/27/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GP-8A_1/27/00_NM	GP-8A		1/27/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
GP-8B_1/27/00_NM	GP-8B		1/27/2000	4-Chloroaniline	0	ug/l	200	Solutia, 8/2000
GP-9B_1/28/00_NM	GP-9B		1/28/2000	4-Chloroaniline	500	ug/l		Solutia, 8/2000
GW-1(T)_12/14/99_NM	GW-1(T)		12/14/1999	4-Chloroaniline	0	ug/l		Trench Samples. IEPA , July 31, 2000
GW-2(T)_12/14/99_NM	GW-2(T)		12/14/1999	4-Chloroaniline	0	ug/l		Trench Samples. IEPA , July 31, 2000
GW-3(T)_12/14/99_NM	GW-3(T)		12/14/1999	4-Chloroaniline	0	ug/l		Trench Samples. IEPA , July 31, 2000
GW-4(T)_12/14/99_NM	GW-4(T)		12/14/1999	4-Chloroaniline	0	ug/l		Trench Samples. IEPA , July 31, 2000
GW-5(T)_12/14/99_NM	GW-5(T)		12/14/1999	4-Chloroaniline	0	ug/l		Trench Samples. IEPA , July 31, 2000
GW-56_3/26/87_NM	GW-56	DC-GW-56	3/26/1987	4-Chloroaniline	0	ug/l		Need RDL; Source is EEI 1988.
GW-6(T)_12/14/99_NM	GW-6(T)		12/14/1999	4-Chloroaniline	0	ug/l		Trench Samples. IEPA , July 31, 2000
MCDONALD_3/26/87_NM	MCDONALD		3/26/1987	4-Chloroaniline	0	ug/l		EEI 1998. Source is EEI 1988.
MW-3B_1/27/00_NM	MW-3B		1/27/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
MW-5B_1/28/00_NM	MW-5B		1/28/2000	4-Chloroaniline	200	ug/l		Solutia, 8/2000
MW-7B_1/25/00_NM	MW-7B		1/25/2000	4-Chloroaniline	0	ug/l	20	Solutia, 8/2000
NTF-B72_1/15/00_NM	NTF-B72		1/15/2000	4-Chloroaniline	0	ug/l		Solutia, 8/2000
NTF-B74_1/15/00_NM	NTF-B74		1/15/2000	4-Chloroaniline	0	ug/l		Solutia, 8/2000
NTF-B75_1/15/00_NM	NTF-B75		1/15/2000	4-Chloroaniline	72	ug/l		Solutia, 8/2000
NTF-B76_1/15/00_NM	NTF-B76		1/15/2000	4-Chloroaniline	0	ug/l		Solutia, 8/2000
NTF-B77_1/15/00_NM	NTF-B77		1/15/2000	4-Chloroaniline	0	ug/l		Solutia, 8/2000
NTF-B78_1/15/00_NM	NTF-B78		1/15/2000	4-Chloroaniline	0	ug/l		Solutia, 8/2000
P-1_3/25/87_NM	P-1	DC-GW-44	3/25/1987	4-Chloroaniline	0	ug/l	11	Source is EEI 1988.
P-1_6/3/92_NM	P-1		6/3/1992	4-Chloroaniline	450	ug/l		EEI 1998. Source is G&M 1994.
P-10_6/4/92_NM	P-10		6/4/1992	4-Chloroaniline	29000	ug/l		EEI 1998. Source is G&M 1994.
P-11_3/15/87_NM	P-11		3/15/1987	4-Chloroaniline	4020	ug/l		EEI 1998. Source is G&M 1990.
P-11_3/25/87_NM	P-11	DC-GW-50	3/25/1987	4-Chloroaniline	4100	ug/l		Need RDL; Source is EEI 1988.
P-11_6/4/92_NM	P-11		6/4/1992	4-Chloroaniline	22000	ug/l		EEI 1998. Source is G&M 1994.
P-12_6/4/92_NM	P-12		6/4/1992	4-Chloroaniline	10000	ug/l		EEI 1998. Source is G&M 1994.
P-13_6/8/92_NM	P-13		6/8/1992	4-Chloroaniline	4300	ug/l		EEI 1998. Source is G&M 1994.
P-14_11/15/91_NM	P-14		11/15/1991	4-Chloroaniline	0	ug/l	10	EEI 1998. Source is G&M 1994.
P-14_6/5/92_NM	P-14		6/5/1992	4-Chloroaniline	200	ug/l		EEI 1998. Source is G&M 1994.
P-2_11/15/91_NM	P-2		11/15/1991	4-Chloroaniline	50400	ug/l		EEI 1998. Source is G&M 1994.
P-2_6/3/92_NM	P-2		6/3/1992	4-Chloroaniline	44000	ug/l		EEI 1998. Source is G&M 1994.

SAMP_ID	Well_ID	Lab_ID	Coll_date	Analyte	Result	Units	RDL	Comment
P-3_6/3/92_NM	P-3		6/3/1992	4-Chloroaniline	680	ug/l		EEI 1998. Source is G&M 1994.
P-6_11/15/91_NM	P-6		11/15/1991	4-Chloroaniline	1570	ug/l		EEI 1998. Source is G&M 1990.
P-6_6/3/92_NM	P-6		6/3/1992	4-Chloroaniline	1600	ug/l		EEI 1998. Source is G&M 1994.
P-7_11/15/91_NM	P-7		11/15/1991	4-Chloroaniline	12500	ug/l		EEI 1998. Source is G&M 1994.
P-7_3/15/89_NM	P-7		3/15/1989	4-Chloroaniline	51200	ug/l		EEI 1998. Source is G&M 1994.
P-7_3/25/87_NM	P-7	GW-46	3/25/1987	4-Chloroaniline	15000	ug/l		EEI 1998. Source is G&M 1994.
P-7_31851_NM	P-7		3/15/1987	4-Chloroaniline	0	ug/l	11	EEI 1998. Source is G&M 1990.
P-7_31861_NM	P-7	DC-GW-46	3/25/1987	4-Chloroaniline	25000	ug/l		Need RDL; Source is EEI 1988.
P-7_6/4/92_NM	P-7		6/4/1992	4-Chloroaniline	22000	ug/l		EEI 1998. Source is G&M 1994.
P-8_11/15/91_NM	P-8		11/15/1991	4-Chloroaniline	105000	ug/l		EEI 1998. Source is G&M 1994.
P-8_3/15/89_NM	P-8		3/15/1989	4-Chloroaniline	49100	ug/l		EEI 1998. Source is G&M 1990.
P-8_6/4/92_NM	P-8		6/4/1992	4-Chloroaniline	59000	ug/l		EEI 1998. Source is G&M 1994.
PCB-B60_1/15/00_NM	PCB-B60		1/15/2000	4-Chloroaniline	0	ug/l		Solutia, 8/2000
SCHMIDT_3/26/87_NM	SCHMIDT	G202	3/26/1987	4-Chloroaniline	0	ug/l		EEI 1998. Source is EEI 1988.
SCT-B67_1/15/00_NM	SCT-B67		1/15/2000	4-Chloroaniline	0	ug/l		Solutia, 8/2000
SCT-B68_1/15/00_NM	SCT-B68		1/15/2000	4-Chloroaniline	0	ug/l		Solutia, 8/2000
SCT-B69_1/15/00_NM	SCT-B69		1/15/2000	4-Chloroaniline	0	ug/l		Solutia, 8/2000
SCT-B71_1/15/00_NM	SCT-B71		1/15/2000	4-Chloroaniline	60	ug/l		Solutia, 8/2000
SETTLES_3/26/87_NM	SETTLES	G201	3/26/1987	4-Chloroaniline	0	ug/l		EEI 1998. Source is EEI 1988.
SOT-B64_1/15/00_NM	SOT-B64		1/15/2000	4-Chloroaniline	0	ug/l		Solutia, 8/2000
SOT-B65_1/15/00_NM	SOT-B65		1/15/2000	4-Chloroaniline	0	ug/l		Solutia, 8/2000
SOT-B66_1/15/00_NM	SOT-B66		1/15/2000	4-Chloroaniline	0	ug/l		Solutia, 8/2000
WRIGHT_3/26/87_NM	WRIGHT		3/26/1987	4-Chloroaniline	0	ug/l		EEI 1998. Source is EEI 1988.
ALLEN_3/27/91_NM	ALLEN	G205; S06	3/27/1991	Aldrin	0	ug/l		EEI 1998; CERCLA SSIR, AREA 1
ALLEN_3/3/82_NM	ALLEN	G205; S06	3/3/1982	Aldrin	0	ug/l		EEI 1998
B-24A_2/15/86_NM	B-24A		2/15/1986	Aldrin	0	ug/l	2	EEI 1998. Source is G&M 1994.
B-25A_3/15/87_NM	B-25A		3/15/1987	Aldrin	0	ug/l	210	EEI 1998. Source is G&M 1990.
B-25A_3/25/87_NM	B-25A	DC-GW-49	3/25/1987	Aldrin	0	ug/l		Need RDL; Source is EEI 1988.
B-25A_6/15/84_NM	B-25A		6/15/1984	Aldrin	0	ug/l	10	EEI 1998. Source is G&M 1994.
B-25B_6/15/84_NM	B-25B		6/15/1984	Aldrin	0	ug/l	10	EEI 1998. Source is G&M 1994.
B-26A_3/15/87_NM	B-26A		3/15/1987	Aldrin	0	ug/l	2.1	EEI 1998. Source is G&M 1990.
B-26A_3/25/87_DUP	B-26A	GW-48	3/25/1987	Aldrin	0	ug/l		EEI 1998. Source is G&M 1990.
B-26A_3/25/87_NM	B-26A	GW-47	3/25/1987	Aldrin	0	ug/l		EEI 1998. Source is G&M 1990.
B-27B_9/15/84_NM	B-27B		9/15/1984	Aldrin	0	ug/l	4	EEI 1998. Source is G&M 1990.
B-28A_2/15/86_NM	B-28A		2/15/1986	Aldrin	0	ug/l	2	EEI 1998. Source is G&M 1990.
B-28A_3/15/87_NM	B-28A		3/15/1987	Aldrin	0	ug/l	2	EEI 1998. Source is G&M 1990.
B-28A_3/25/87_NM	B-28A	DC-GW-45	3/25/1987	Aldrin	0	ug/l		Need RDL; Source is EEI 1988.
B-29A_6/15/84_NM	B-29A		6/15/1984	Aldrin	0	ug/l	10	EEI 1998. Source is G&M 1994.
B-29B_11/15/84_NM	B-29B		11/15/1984	Aldrin	0	ug/l	50	EEI 1998. Source is G&M 1994.
B-29B_6/15/84_DUP	B-29B		6/15/1984	Aldrin	0	ug/l	10	EEI 1998. Source is G&M 1994.
B-29B_6/15/84_DUP	B-29B		6/15/1984	Aldrin	0	ug/l	100	EEI 1998. Source is G&M 1994.
B-29B_6/15/84_NM	B-29B		6/15/1984	Aldrin	0	ug/l	10	EEI 1998. Source is G&M 1994.
BALLET_3/27/91_NM	BALLET	G203	3/27/1991	Aldrin	0	ug/l		EEI 1998; CERCLA SSIR, AREA 1
BAUMEYER_3/3/82_NM	BAUMEYER	S01	3/3/1982	Aldrin	0	ug/l		EEI 1998
DW-35_2/15/85_NM	DW-35		2/15/1985	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
DW-35_5/15/85_NM	DW-35		5/15/1985	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
DW-36_2/15/85_NM	DW-36		2/15/1985	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
DW-36_5/15/85_NM	DW-36		5/15/1985	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
DW-A_11/15/85_NM	DW-A		11/15/1985	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
DW-A_2/15/86_NM	DW-A		2/15/1986	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
EE-01_3/17/87_NM	EE-01	DC-GW-10	3/17/1987	Aldrin	0	ug/l		EEI 1998; Source is EEI 1988.
EE-02_3/17/87_NM	EE-02	DC-GW-11	3/17/1987	Aldrin	0	ug/l		EEI 1998; Source is EEI 1988.

SAMP_ID	Well_ID	Lab_ID	Col_date	Analyte	Result	Units	RDL	Comment
EE-03_3/17/87_NM	EE-03	DC-GW-12	3/17/1987	Aldrin	0	ug/l		EEI 1998; Source is EEI 1988.
EE-04_3/17/87_NM	EE-04	DC-GW-13	3/17/1987	Aldrin	0	ug/l		EEI 1998; Source is EEI 1988.
EE-06_3/16/87_NM	EE-06	DC-GW-01	3/16/1987	Aldrin	0	ug/l		Need RDL; Source is EEI 1988.
EE-07_3/16/87_NM	EE-07	DC-GW-02	3/16/1987	Aldrin	0	ug/l		Need RDL; Source is EEI 1988.
EE-08_3/16/87_NM	EE-08	DC-GW--06	3/16/1987	Aldrin	0	ug/l		Need RDL; Source is EEI 1988.
EE-09_3/16/87_NM	EE-09	DC-GW-03	3/16/1987	Aldrin	0	ug/l		Need RDL; Source is EEI 1988.
EE-10_3/16/87_NM	EE-10	DC-GW-04	3/16/1987	Aldrin	0	ug/l		Need RDL; Source is EEI 1988.
EE-12_3/23/87_DUP	EE-12	DC-GW-29	3/23/1987	Aldrin	0	ug/l		EEI 1998; Source is EEI 1988.
EE-12_3/23/87_NM	EE-12	DC-GW-24	3/23/1987	Aldrin	0	ug/l		EEI 1998; Source is EEI 1988.
EE-13_3/23/87_NM	EE-13	DC-GW-23	3/23/1987	Aldrin	0	ug/l		EEI 1998; Source is EEI 1988.
EE-14_3/23/87_NM	EE-14	DC-GW-26	3/23/1987	Aldrin	0	ug/l		EEI 1998; Source is EEI 1988.
EE-15_3/23/87_NM	EE-15	DC-GW-27	3/23/1987	Aldrin	0	ug/l		EEI 1998; Source is EEI 1988.
EE-16_3/23/87_NM	EE-16	DC-GW-28	3/23/1987	Aldrin	0	ug/l		EEI 1998; Source is EEI 1988.
EE-17_3/16/87_NM	EE-17	DC-GW-05	3/16/1987	Aldrin	0	ug/l		Need RDL; Source is EEI 1988.
EE-18_3/16/87_NM	EE-18	DC-GW-09	3/16/1987	Aldrin	0	ug/l		Need RDL; Source is EEI 1988.
EE-19_3/16/87_DUP	EE-19	DC-GW-08	3/16/1987	Aldrin	0	ug/l		Need RDL; Source is EEI 1988.
EE-19_3/16/87_NM	EE-19	DC-GW-07	3/16/1987	Aldrin	0	ug/l		Need RDL; Source is EEI 1988.
EE-20_3/23/87_NM	EE-20	DC-GW-31	3/23/1987	Aldrin	0	ug/l		EEI 1998; Source is EEI 1988.
EE-21_3/24/87_NM	EE-21	DC-GW-38	3/24/1987	Aldrin	0	ug/l	2.2	Source is EEI 1988.
EE-21_7/14/87_NM	EE-21	DC-GW-38A	7/14/1987	Aldrin	0	ug/l	1.9	Source is EEI 1988.
EE-22_3/24/87_NM	EE-22	DC-GW-39	3/24/1987	Aldrin	0	ug/l	420	Source is EEI 1988.
EE-22_7/14/87_NM	EE-22	DC-GW-39A	7/14/1987	Aldrin	0	ug/l	20	Source is EEI 1988.
EE-23_3/24/87_NM	EE-23	DC-GW-40	3/24/1987	Aldrin	0	ug/l	2.1	Source is EEI 1988.
EE-23_7/14/87_NM	EE-23	DC-GW-40A	7/14/1987	Aldrin	0	ug/l	2	Source is EEI 1988.
EE-24_3/24/87_DUP	EE-24	DC-GW-42	3/24/1987	Aldrin	0	ug/l	2.1	Source is EEI 1988.
EE-24_3/24/87_NM	EE-24	DC-GW-41	3/24/1987	Aldrin	0	ug/l	2.1	Need RDL; Source is EEI 1988.
EE-24_7/14/87_NM	EE-24	DC-GW-41A	7/14/1987	Aldrin	0	ug/l	1.9	Source is EEI 1988.
EE-25_3/24/87_NM	EE-25	DC-GW-43	3/24/1987	Aldrin	0	ug/l	2.2	Source is EEI 1988.
EE-25_7/14/87_NM	EE-25	DC-GW-43A	7/14/1987	Aldrin	0	ug/l	2	Source is EEI 1988.
G101(99)_5/24/99_NM	G101(99)		5/24/1999	Aldrin	0	ug/l		IEPA, March 2000 Trip Report
G101(K)_5/10/99_NM	G101(K)		5/10/1999	Aldrin	0	ug/l		Solutia, 8/2000
G102(99)_5/24/99_NM	G102(99)		5/24/1999	Aldrin	0	ug/l		IEPA, March 2000 Trip Report
G102(K)_5/10/99_NM	G102(K)		5/10/1999	Aldrin	0	ug/l		Solutia, 8/2000
G103(99)_5/24/99_NM	G103(99)		5/24/1999	Aldrin	0	ug/l		IEPA, March 2000 Trip Report
G103(K)_5/10/99_NM	G103(K)		5/10/1999	Aldrin	0	ug/l		Solutia, 8/2000
G104(99)_5/26/99_NM	G104(99)		5/26/1999	Aldrin	0.057	ug/l		IEPA, March 2000 Trip Report
G104(K)_5/11/99_NM	G104(K)		5/11/1999	Aldrin	0	ug/l		Solutia, 8/2000
G105(K)_5/11/99_NM	G105(K)		5/11/1999	Aldrin	0	ug/l		Solutia, 8/2000
G106(99)_5/27/99_NM	G106(99)		5/27/1999	Aldrin	0	ug/l		IEPA, March 2000 Trip Report
G106(K)_5/11/99_DUP	G106(K)	G116(K)	5/11/1999	Aldrin	0	ug/l		Solutia, 8/2000
G106(K)_5/11/99_NM	G106(K)		5/11/1999	Aldrin	0	ug/l		Solutia, 8/2000
G107(99)_5/27/99_NM	G107(99)		5/27/1999	Aldrin	0	ug/l		IEPA, March 2000 Trip Report
G107(K)_5/12/99_NM	G107(K)		5/12/1999	Aldrin	0	ug/l		Solutia, 8/2000
G108(99)_5/25/99_NM	G108(99)		5/25/1999	Aldrin	0	ug/l		IEPA, March 2000 Trip Report
G108(K)_5/11/99_NM	G108(K)		5/11/1999	Aldrin	0	ug/l		Solutia, 8/2000
G108_3/18/87_NM	G108	DC-GW-18	3/18/1987	Aldrin	0	ug/l		EEI 1998. Source is EEI 1988.
G109(99)_5/27/99_NM	G109(99)		5/27/1999	Aldrin	0	ug/l		IEPA, March 2000 Trip Report
G109(K)_5/12/99_NM	G109(K)		5/12/1999	Aldrin	0	ug/l		Solutia, 8/2000
G109_3/24/87_NM	G109	DC-GW-37	3/24/1987	Aldrin	0	ug/l		EEI 1998. Source is EEI 1988.
G110(99)_5/26/99_NM	G110(99)		5/26/1999	Aldrin	0.0064	ug/l		IEPA, March 2000 Trip Report
G110(K)_5/13/99_NM	G110(K)		5/13/1999	Aldrin	0	ug/l		Solutia, 8/2000
G110_3/24/87_NM	G110	DC-GW-36	3/24/1987	Aldrin	0	ug/l		EEI 1998; Source is EEI 1988.

SAMP_ID	Well_ID	Lab_ID	Coll_Date	Analyte	Result	Units	RDL	Comment
G111(99)_5/24/99_NM	G111(99)		5/24/1999	Aldrin	0	ug/l		IEPA, March 2000 Trip Report
G111(K)_5/12/99_NM	G111(K)		5/12/1999	Aldrin	0	ug/l		Solutia, 8/2000
G112(99)_5/25/99_NM	G112(99)		5/25/1999	Aldrin	0	ug/l		IEPA, March 2000 Trip Report
G112(K)_5/13/99_NM	G112(K)		5/13/1999	Aldrin	0	ug/l		Solutia, 8/2000
G112_3/23/87_NM	G112		3/23/1987	Aldrin	0	ug/l		EEI 1998; Source is EEI 1988.
G113(99)_5/25/99_NM	G113(99)		5/25/1999	Aldrin	0.024	ug/l		IEPA, March 2000 Trip Report
G113(K)_5/13/99_NM	G113(K)		5/13/1999	Aldrin	0	ug/l		Solutia, 8/2000
G114(99)_5/25/99_DUP	G114(99)	G115(99)	5/25/1999	Aldrin	0	ug/l		IEPA, March 2000 Trip Report
G114(99)_5/25/99_NM	G114(99)		5/25/1999	Aldrin	0	ug/l		IEPA, March 2000 Trip Report
G114(K)_5/12/99_NM	G114(K)		5/12/1999	Aldrin	0	ug/l		Solutia, 8/2000
G115(K)_5/12/99_NM	G115(K)		5/12/1999	Aldrin	0	ug/l		Solutia, 8/2000
G116(99)_5/26/99_NM	G116(99)		5/26/1999	Aldrin	0.12	ug/l		IEPA, March 2000 Trip Report
G117(99)_5/27/99_NM	G117(99)		5/27/1999	Aldrin	0.072	ug/l		IEPA, March 2000 Trip Report
GM-106_11/15/85_NM	GM-106		11/15/1985	Aldrin	0	ug/l	1.9	EEI 1998. Source is G&M 1994.
GM-106_2/15/86_DUP	GM-106		2/15/1986	Aldrin	0	ug/l	1.9	EEI 1998. Source is G&M 1994.
GM-106_2/15/86_NM	GM-106		2/15/1986	Aldrin	0	ug/l	2	EEI 1998. Source is G&M 1994.
GM-106_6/8/92_DUP	GM-106		6/8/1992	Aldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GM-106_6/8/92_NM	GM-106		6/8/1992	Aldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GM-19A_11/15/84_NM	GM-19A		11/15/1984	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-19A_9/15/84_NM	GM-19A		9/15/1984	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-19B_11/15/84_NM	GM-19B		11/15/1984	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-19B_2/15/85_DUP	GM-19B		2/15/1985	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-19B_2/15/85_NM	GM-19B		2/15/1985	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-19B_9/15/84_NM	GM-19B		9/15/1984	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-19C_11/15/84_NM	GM-19C		11/15/1984	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-19C_2/15/85_NM	GM-19C		2/15/1985	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-19C_9/15/84_NM	GM-19C		9/15/1984	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-20A_2/15/86_NM	GM-20A		2/15/1986	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-20A_9/15/84_NM	GM-20A		9/15/1984	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-20B_2/15/85_NM	GM-20B		2/15/1985	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-20B_9/15/84_NM	GM-20B		9/15/1984	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-21A_2/15/86_NM	GM-21A		2/15/1986	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-21A_9/15/84_NM	GM-21A		9/15/1984	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-21B_2/15/85_NM	GM-21B		2/15/1985	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-21B_5/15/85_NM	GM-21B		5/15/1985	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-22A_2/15/85_NM	GM-22A		2/15/1985	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-22A_9/15/84_NM	GM-22A		9/15/1984	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-22B_2/15/85_DUP	GM-22B		2/15/1985	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-22B_2/15/85_NM	GM-22B		2/15/1985	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-22B_5/15/85_NM	GM-22B		5/15/1985	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-23_2/15/86_NM	GM-23		2/15/1986	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-23_9/15/84_NM	GM-23		9/15/1984	Aldrin	0.078	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-24A_11/15/84_NM	GM-24A		11/15/1984	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-24A_9/15/84_NM	GM-24A		9/15/1984	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-24B_11/15/84_NM	GM-24B		11/15/1984	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-24B_9/15/84_NM	GM-24B		9/15/1984	Aldrin	0.003	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-26A_2/15/86_NM	GM-26A		2/15/1986	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-26A_9/15/84_NM	GM-26A		9/15/1984	Aldrin	0.028	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-26B_2/15/85_NM	GM-26B		2/15/1985	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-26B_9/15/84_NM	GM-26B		9/15/1984	Aldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-27B_11/15/87_NM	GM-27B		11/15/1987	Aldrin	0	ug/l	2.2	EEI 1998. Source is G&M 1990.
GM-27B_2/15/86_NM	GM-27B		2/15/1986	Aldrin	0	ug/l	2	EEI 1998. Source is G&M 1994.

SAMP_ID	Well_ID	Lab_ID	Coll_date	Analyte	Result	Units	SDL	Comment
GM-27B_6/9/92_NM	GM-27B		6/9/1992	Aldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GM-27B_9/15/84_NM	GM-27B		9/15/1984	Aldrin	0.016	ug/l		EEI 1998. Source is G&M 1994.
GM-27C_11/15/87_NM	GM-27C		11/15/1987	Aldrin	0	ug/l	2.2	EEI 1998. Source is G&M 1990.
GM-27C_2/15/86_NM	GM-27C		2/15/1986	Aldrin	0	ug/l	1.9	EEI 1998. Source is G&M 1994.
GM-27C_6/9/92_NM	GM-27C		6/9/1992	Aldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GM-27C_9/15/84_NM	GM-27C		9/15/1984	Aldrin	0.034	ug/l		EEI 1998. Source is G&M 1994.
GM-28B_11/15/87_NM	GM-28B		11/15/1987	Aldrin	0	ug/l	190	EEI 1998. Source is G&M 1990.
GM-28B_2/15/86_NM	GM-28B		2/15/1986	Aldrin	0	ug/l	1.9	EEI 1998. Source is G&M 1994.
GM-28B_3/15/89_NM	GM-28B		3/15/1989	Aldrin	0	ug/l	20	EEI 1998. Source is G&M 1990.
GM-28B_6/5/92_NM	GM-28B		6/5/1992	Aldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GM-28B_9/15/84_NM	GM-28B		9/15/1984	Aldrin	0	ug/l	0.004	EEI 1998. Source is G&M 1994.
GM-28C_11/15/87_NM	GM-28C		11/15/1987	Aldrin	0	ug/l	1.9	EEI 1998. Source is G&M 1990.
GM-28C_2/15/86_NM	GM-28C		2/15/1986	Aldrin	0	ug/l	1.9	EEI 1998. Source is G&M 1994.
GM-28C_3/15/89_DUP	GM-28C		3/15/1989	Aldrin	0	ug/l	190	EEI 1998. Source is G&M 1990.
GM-28C_3/15/89_NM	GM-28C		3/15/1989	Aldrin	0	ug/l	1900	EEI 1998. Source is G&M 1990.
GM-28C_6/8/92_NM	GM-28C		6/8/1992	Aldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GM-28C_9/15/84_NM	GM-28C		9/15/1984	Aldrin	0	ug/l	0.04	EEI 1998. Source is G&M 1994.
GM-31A_11/15/87_DUP	GM-31A		11/15/1987	Aldrin	0	ug/l	2	EEI 1998. Source is G&M 1990.
GM-31A_11/15/87_NM	GM-31A		11/15/1987	Aldrin	0	ug/l	2	EEI 1998. Source is G&M 1990.
GM-54A_11/15/87_NM	GM-54A		11/15/1987	Aldrin	0	ug/l	2	EEI 1998. Source is G&M 1988.
GM-54B_11/15/87_NM	GM-54B		11/15/1987	Aldrin	0	ug/l	2.1	EEI 1998. Source is G&M 1988.
GM-55C_11/15/87_NM	GM-55C		11/15/1987	Aldrin	0	ug/l	2	EEI 1998. Source is G&M 1990.
GM-55C_5/15/88_NM	GM-55C		5/15/1988	Aldrin	0	ug/l	45	EEI 1998. Source is G&M 1990.
GM-55C_6/8/92_NM	GM-55C		6/8/1992	Aldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GM-56C_11/15/87_NM	GM-56C		11/15/1987	Aldrin	0	ug/l	190	EEI 1998. Source is G&M 1990.
GM-56C_5/15/88_NM	GM-56C		5/15/1988	Aldrin	0	ug/l	120	EEI 1998. Source is G&M 1990.
GM-56C_6/5/92_NM	GM-56C		6/5/1992	Aldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GM-57C_11/15/87_DUP	GM-57C		11/15/1987	Aldrin	0	ug/l	220	EEI 1998. Source is G&M 1990.
GM-57C_11/15/87_NM	GM-57C		11/15/1987	Aldrin	0	ug/l	210	EEI 1998. Source is G&M 1990.
GM-57C_3/15/89_NM	GM-57C		3/15/1989	Aldrin	0	ug/l	20	EEI 1998. Source is G&M 1990.
GM-57C_5/15/88_DUP	GM-57C		5/15/1988	Aldrin	0	ug/l	98	EEI 1998. Source is G&M 1990.
GM-57C_5/15/88_NM	GM-57C		5/15/1988	Aldrin	0	ug/l	96	EEI 1998. Source is G&M 1990.
GM-57C_6/5/92_NM	GM-57C		6/5/1992	Aldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GM-58A_11/15/87_NM	GM-58A		11/15/1987	Aldrin	0	ug/l	1.9	EEI 1998. Source is G&M 1990.
GM-58A_5/15/88_NM	GM-58A		5/15/1988	Aldrin	0	ug/l	2.2	EEI 1998. Source is G&M 1990.
GM-59A_11/15/87_NM	GM-59A		11/15/1987	Aldrin	0	ug/l	1.9	EEI 1998. Source is G&M 1990.
GM-59A_5/15/88_NM	GM-59A		5/15/1988	Aldrin	0	ug/l	1.9	EEI 1998. Source is G&M 1990.
GM-62A_11/15/88_NM	GM-62A		11/15/1988	Aldrin	0	ug/l	2.2	EEI 1998. Source is G&M 1994.
GM-62A_6/10/92_NM	GM-62A		6/10/1992	Aldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GM-62A_8/15/88_NM	GM-62A		8/15/1988	Aldrin	0	ug/l	2	EEI 1998. Source is G&M 1994.
GM-62B_11/15/88_DUP	GM-62B		11/15/1988	Aldrin	0	ug/l	10	EEI 1998. Source is G&M 1994.
GM-62B_11/15/88_NM	GM-62B		11/15/1988	Aldrin	0	ug/l	1.9	EEI 1998. Source is G&M 1994.
GM-62B_6/9/92_DUP	GM-62B		6/9/1992	Aldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GM-62B_6/9/92_NM	GM-62B		6/9/1992	Aldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GM-62B_8/15/88_DUP	GM-62B		8/15/1988	Aldrin	0	ug/l	2	EEI 1998. Source is G&M 1994.
GM-62B_8/15/88_NM	GM-62B		8/15/1988	Aldrin	0	ug/l	2.2	EEI 1998. Source is G&M 1994.
GM-62C_11/15/88_NM	GM-62C		11/15/1988	Aldrin	0	ug/l	2.1	EEI 1998. Source is G&M 1994.
GM-62C_6/9/92_NM	GM-62C		6/9/1992	Aldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GM-65A_6/10/92_NM	GM-65A		6/10/1992	Aldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GM-66A_6/11/92_NM	GM-66A		6/11/1992	Aldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GM-66B_6/11/92_NM	GM-66B		6/11/1992	Aldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GM-66C_6/10/92_DUP	GM-66C		6/10/1992	Aldrin	0	ug/l		EEI 1998. Source is G&M 1994.

SAMP_ID	Well_ID	Lab_ID	Coll_date	Analyte	Result	Units	RDL	Comment
GM-66C_6/10/92_NM	GM-66C		6/10/1992	Aldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GW-56_3/26/87_NM	GW-56	DC-GW-56	3/26/1987	Aldrin	0	ug/l		Need RDL; Source is EEI 1988.
HAYES_3/3/82_NM	HAYES	S03	3/3/1982	Aldrin	0	ug/l		EEI 1998
KEARBY_3/28/91_NM	KEARBY	G204	3/28/1991	Aldrin	0	ug/l		EEI 1998; CERCLA SSIR, AREA 1
LYERLA_3/3/82_NM	LYERLA	S02	3/3/1982	Aldrin	0	ug/l		EEI 1998
MCDONALD_3/26/87_NM	MCDONA LD		3/26/1987	Aldrin	0	ug/l		EEI 1998. Source is EEI 1988.
P-1_11/15/87_NM	P-1		11/15/1987	Aldrin	0	ug/l	2	EEI 1998. Source is G&M 1990.
P-1_3/25/87_NM	P-1	DC-GW-44	3/25/1987	Aldrin	0	ug/l	2.1	Source is G&M 1990.
P-1_6/3/92_NM	P-1		6/3/1992	Aldrin	0	ug/l		EEI 1998. Source is G&M 1994.
P-1_9/15/84_NM	P-1		9/15/1984	Aldrin	0	ug/l	0.08	EEI 1998. Source is G&M 1990.
P-10_11/15/87_NM	P-10		11/15/1987	Aldrin	0	ug/l	190	EEI 1998. Source is G&M 1990.
P-10_6/4/92_NM	P-10		6/4/1992	Aldrin	0	ug/l		EEI 1998. Source is G&M 1994.
P-10_9/15/84_NM	P-10		9/15/1984	Aldrin	0	ug/l	40	EEI 1998. Source is G&M 1994.
P-11_11/15/87_NM	P-11		11/15/1987	Aldrin	0	ug/l	2	EEI 1998. Source is G&M 1990.
P-11_3/15/87_NM	P-11		3/15/1987	Aldrin	0	ug/l	2.1	EEI 1998. Source is G&M 1990.
P-11_3/25/87_NM	P-11	DC-GW-50	3/25/1987	Aldrin	0	ug/l		Need RDL; Source is EEI 1988.
P-11_6/4/92_NM	P-11		6/4/1992	Aldrin	0	ug/l		EEI 1998. Source is G&M 1994.
P-11_9/15/84_NM	P-11		9/15/1984	Aldrin	0.139	ug/l		EEI 1998. Source is G&M 1994.
P-12_11/15/87_NM	P-12		11/15/1987	Aldrin	0	ug/l	1.9	EEI 1998. Source is G&M 1990.
P-12_6/4/92_NM	P-12		6/4/1992	Aldrin	0	ug/l		EEI 1998. Source is G&M 1994.
P-12_9/15/84_NM	P-12		9/15/1984	Aldrin	0	ug/l	0.004	EEI 1998. Source is G&M 1990.
P-13_11/15/87_NM	P-13		11/15/1987	Aldrin	0	ug/l	1.9	EEI 1998. Source is G&M 1990.
P-13_6/15/84_DUP	P-13		6/15/1984	Aldrin	0	ug/l	10	EEI 1998. Source is EEI 1988
P-13_6/15/84_DUP	P-13		6/15/1984	Aldrin	0	ug/l	10	EEI 1998. Source is EEI 1988
P-13_6/15/84_NM	P-13		6/15/1984	Aldrin	0	ug/l	10	EEI 1998. Source is EEI 1988
P-14_11/15/87_NM	P-14		11/15/1987	Aldrin	0	ug/l	1.9	EEI 1998. Source is G&M 1990.
P-14_6/15/84_NM	P-14		6/15/1984	Aldrin	0	ug/l	10	EEI 1998. Source is EEI 1988.
P-14_6/5/92_NM	P-14		6/5/1992	Aldrin	0	ug/l		EEI 1998. Source is G&M 1994.
P-2_11/15/87_NM	P-2		11/15/1987	Aldrin	0	ug/l	2	EEI 1998. Source is G&M 1990.
P-2_6/15/84_NM	P-2		6/15/1984	Aldrin	0	ug/l	10	EEI 1998. Source is G&M 1994.
P-2_6/3/92_NM	P-2		6/3/1992	Aldrin	0	ug/l		EEI 1998. Source is G&M 1994.
P-3_11/15/87_NM	P-3		11/15/1987	Aldrin	0	ug/l	1.9	EEI 1998. Source is G&M 1990.
P-3_6/3/92_NM	P-3		6/3/1992	Aldrin	0	ug/l		EEI 1998. Source is G&M 1994.
P-6_11/15/87_NM	P-6		11/15/1987	Aldrin	0	ug/l	36	EEI 1998. Source is G&M 1990.
P-6_6/15/84_NM	P-6		6/15/1984	Aldrin	0	ug/l	10	EEI 1998. Source is G&M 1994.
P-6_6/3/92_NM	P-6		6/3/1992	Aldrin	0	ug/l		EEI 1998. Source is G&M 1994.
P-7_11/15/87_NM	P-7		11/15/1987	Aldrin	0	ug/l	1.9	EEI 1998. Source is G&M 1994.
P-7_3/15/89_NM	P-7		3/15/1989	Aldrin	0	ug/l	20	EEI 1998. Source is G&M 1994.
P-7_3/25/87_NM	P-7	GW-46	3/25/1987	Aldrin	0	ug/l	2.1	EEI 1998. Source is G&M 1994.
P-7_6/15/84_NM	P-7		6/15/1984	Aldrin	0	ug/l	10	EEI 1998. Source is G&M 1990.
P-7_6/4/92_NM	P-7		6/4/1992	Aldrin	0	ug/l		EEI 1998. Source is G&M 1994.
P-8_11/15/87_NM	P-8		11/15/1987	Aldrin	0	ug/l	190	EEI 1998. Source is G&M 1990.
P-8_3/15/89_NM	P-8		3/15/1989	Aldrin	0	ug/l	970	EEI 1998. Source is G&M 1990.
P-8_6/15/84_NM	P-8		6/15/1984	Aldrin	0	ug/l	10	EEI 1998. Source is G&M 1994.
P-8_6/4/92_NM	P-8		6/4/1992	Aldrin	0	ug/l		EEI 1998. Source is G&M 1994.
S04_3/3/82_NM	S04		3/3/1982	Aldrin	0.17	ug/l		EEI 1998
S05_3/3/82_NM	S05		3/3/1982	Aldrin	0	ug/l		EEI 1998
SCHMIDT_3/26/87_NM	SCHMIDT	G202	3/26/1987	Aldrin	0	ug/l		EEI 1998. Source is EEI 1988.
SCHMIDT_3/27/91_NM	SCHMIDT	G202	3/27/1991	Aldrin	0	ug/l		EEI 1998; CERCLA SSIR, AREA 1
SETTLES_3/26/87_NM	SETTLES	G201	3/26/1987	Aldrin	0	ug/l		EEI 1998. Source is EEI 1988.
SETTLES_3/27/91_NM	SETTLES	G201	3/27/1991	Aldrin	0	ug/l		EEI 1998; CERCLA SSIR, AREA 1
WRIGHT_3/26/87_NM	WRIGHT		3/26/1987	Aldrin	0	ug/l		EEI 1998. Source is EEI 1988.

SAMP_ID	Well_ID	Lab_ID	Coll_date	Analyte	Result	Units	RDL	Comment
ALLEN_3/27/91_NM	ALLEN	G205; S06	3/27/1991	Dieldrin	0	ug/l		EEI 1998; CERCLA SSIR, AREA 1
B-24A_2/15/86_NM	B-24A		2/15/1986	Dieldrin	0	ug/l	2.6	EEI 1998. Source is G&M 1994.
B-25A_3/15/87_NM	B-25A		3/15/1987	Dieldrin	0	ug/l	280	EEI 1998. Source is G&M 1990.
B-25A_3/25/87_NM	B-25A	DC-GW-49	3/25/1987	Dieldrin	0	ug/l		Need RDL; Source is EEI 1988.
B-25A_6/15/84_NM	B-25A		6/15/1984	Dieldrin	0	ug/l	10	EEI 1998. Source is G&M 1994.
B-25B_6/15/84_NM	B-25B		6/15/1984	Dieldrin	0	ug/l	10	EEI 1998. Source is G&M 1994.
B-26A_3/15/87_NM	B-26A		3/15/1987	Dieldrin	0	ug/l	2.8	EEI 1998. Source is G&M 1990.
B-26A_3/25/87_DUP	B-26A	GW-48	3/25/1987	Dieldrin	0	ug/l		EEI 1998. Source is G&M 1990.
B-26A_3/25/87_NM	B-26A	GW-47	3/25/1987	Dieldrin	0	ug/l		EEI 1998. Source is G&M 1990.
B-27B_9/15/84_NM	B-27B		9/15/1984	Dieldrin	0	ug/l	7	EEI 1998. Source is G&M 1990.
B-28A_2/15/86_NM	B-28A		2/15/1986	Dieldrin	0	ug/l	2.7	EEI 1998. Source is G&M 1990.
B-28A_3/15/87_NM	B-28A		3/15/1987	Dieldrin	0	ug/l	2.7	EEI 1998. Source is G&M 1990.
B-28A_3/25/87_NM	B-28A	DC-GW-45	3/25/1987	Dieldrin	0	ug/l		Need RDL; Source is EEI 1988.
B-29A_6/15/84_NM	B-29A		6/15/1984	Dieldrin	0	ug/l	10	EEI 1998. Source is G&M 1994.
B-29B_11/15/84_NM	B-29B		11/15/1984	Dieldrin	0	ug/l	50	EEI 1998. Source is G&M 1994.
B-29B_6/15/84_DUP	B-29B		6/15/1984	Dieldrin	0	ug/l	10	EEI 1998. Source is G&M 1994.
B-29B_6/15/84_DUP	B-29B		6/15/1984	Dieldrin	0	ug/l	100	EEI 1998. Source is G&M 1994.
B-29B_6/15/84_NM	B-29B		6/15/1984	Dieldrin	0	ug/l	10	EEI 1998. Source is G&M 1994.
BALLET_3/27/91_NM	BALLET	G203	3/27/1991	Dieldrin	0	ug/l		EEI 1998; CERCLA SSIR, AREA 1
DW-35_2/15/85_NM	DW-35		2/15/1985	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
DW-35_5/15/85_NM	DW-35		5/15/1985	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
DW-36_2/15/85_NM	DW-36		2/15/1985	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
DW-36_5/15/85_NM	DW-36		5/15/1985	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
DW-A_11/15/85_NM	DW-A		11/15/1985	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
DW-A_2/15/86_NM	DW-A		2/15/1986	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
EE-01_3/17/87_NM	EE-01	DC-GW-10	3/17/1987	Dieldrin	0	ug/l		EEI 1998; Source is EEI 1988.
EE-02_3/17/87_NM	EE-02	DC-GW-11	3/17/1987	Dieldrin	0	ug/l		EEI 1998; Source is EEI 1988.
EE-03_3/17/87_NM	EE-03	DC-GW-12	3/17/1987	Dieldrin	0	ug/l		EEI 1998; Source is EEI 1988.
EE-04_3/17/87_NM	EE-04	DC-GW-13	3/17/1987	Dieldrin	0	ug/l		EEI 1998; Source is EEI 1988.
EE-06_3/16/87_NM	EE-06	DC-GW-01	3/16/1987	Dieldrin	0	ug/l		Need RDL; Source is EEI 1988.
EE-07_3/16/87_NM	EE-07	DC-GW-02	3/16/1987	Dieldrin	0	ug/l		Need RDL; Source is EEI 1988.
EE-08_3/16/87_NM	EE-08	DC-GW--06	3/16/1987	Dieldrin	0	ug/l		Need RDL; Source is EEI 1988.
EE-09_3/16/87_NM	EE-09	DC-GW-03	3/16/1987	Dieldrin	0	ug/l		Need RDL; Source is EEI 1988.
EE-10_3/16/87_NM	EE-10	DC-GW-04	3/16/1987	Dieldrin	0	ug/l		Need RDL; Source is EEI 1988.
EE-12_3/23/87_DUP	EE-12	DC-GW-29	3/23/1987	Dieldrin	0	ug/l		EEI 1998; Source is EEI 1988.
EE-12_3/23/87_NM	EE-12	DC-GW-24	3/23/1987	Dieldrin	0	ug/l		EEI 1998; Source is EEI 1988.
EE-13_3/23/87_NM	EE-13	DC-GW-23	3/23/1987	Dieldrin	0	ug/l		EEI 1998; Source is EEI 1988.
EE-14_3/23/87_NM	EE-14	DC-GW-26	3/23/1987	Dieldrin	0	ug/l		EEI 1998; Source is EEI 1988.
EE-15_3/23/87_NM	EE-15	DC-GW-27	3/23/1987	Dieldrin	0	ug/l		EEI 1998; Source is EEI 1988.
EE-16_3/23/87_NM	EE-16	DC-GW-28	3/23/1987	Dieldrin	0	ug/l		EEI 1998; Source is EEI 1988.
EE-17_3/16/87_NM	EE-17	DC-GW-05	3/16/1987	Dieldrin	0	ug/l		Need RDL; Source is EEI 1988.
EE-18_3/16/87_NM	EE-18	DC-GW-09	3/16/1987	Dieldrin	0	ug/l		Need RDL; Source is EEI 1988.
EE-19_3/16/87_DUP	EE-19	DC-GW-08	3/16/1987	Dieldrin	0	ug/l		Need RDL; Source is EEI 1988.
EE-19_3/16/87_NM	EE-19	DC-GW-07	3/16/1987	Dieldrin	0	ug/l		Need RDL; Source is EEI 1988.
EE-20_3/23/87_NM	EE-20	DC-GW-31	3/23/1987	Dieldrin	0	ug/l		EEI 1998; Source is EEI 1988.
EE-21_3/24/87_NM	EE-21	DC-GW-38	3/24/1987	Dieldrin	0	ug/l	2.8	Source is EEI 1988.
EE-21_7/14/87_NM	EE-21	DC-GW-38A	7/14/1987	Dieldrin	0	ug/l	2.6	Source is EEI 1988.
EE-22_3/24/87_NM	EE-22	DC-GW-39	3/24/1987	Dieldrin	0	ug/l	560	Source is EEI 1988.
EE-22_7/14/87_NM	EE-22	DC-GW-39A	7/14/1987	Dieldrin	0	ug/l	27	Source is EEI 1988.
EE-23_3/24/87_NM	EE-23	DC-GW-40	3/24/1987	Dieldrin	0	ug/l	2.8	Source is EEI 1988.
EE-23_7/14/87_NM	EE-23	DC-GW-40A	7/14/1987	Dieldrin	0	ug/l	2.6	Source is EEI 1988.
EE-24_3/24/87_DUP	EE-24	DC-GW-42	3/24/1987	Dieldrin	0	ug/l	2.7	Source is EEI 1988.

SAMP_ID	Well_ID	Lab_ID	Coll_Date	Analyte	Result	Units	SQL	Comment
EE-24_3/24/87_NM	EE-24	DC-GW-41	3/24/1987	Dieldrin	0	ug/l	2.8	Need RDL; Source is EEI 1988.
EE-24_7/14/87_NM	EE-24	DC-GW-41A	7/14/1987	Dieldrin	0	ug/l	2.6	Source is EEI 1988.
EE-25_3/24/87_NM	EE-25	DC-GW-43	3/24/1987	Dieldrin	0	ug/l	2.9	Source is EEI 1988.
EE-25_7/14/87_NM	EE-25	DC-GW-43A	7/14/1987	Dieldrin	0	ug/l	2.9	Source is EEI 1988.
G101(99)_5/24/99_NM	G101(99)		5/24/1999	Dieldrin	0	ug/l		IEPA, March 2000 Trip Report
G101(K)_5/10/99_NM	G101(K)		5/10/1999	Dieldrin	0	ug/l		Solutia, 8/2000
G102(99)_5/24/99_NM	G102(99)		5/24/1999	Dieldrin	0	ug/l		IEPA, March 2000 Trip Report
G102(K)_5/10/99_NM	G102(K)		5/10/1999	Dieldrin	0.95	ug/l		Solutia, 8/2000
G103(99)_5/24/99_NM	G103(99)		5/24/1999	Dieldrin	0	ug/l		IEPA, March 2000 Trip Report
G103(K)_5/10/99_NM	G103(K)		5/10/1999	Dieldrin	0	ug/l		Solutia, 8/2000
G104(99)_5/26/99_NM	G104(99)		5/26/1999	Dieldrin	0	ug/l		IEPA, March 2000 Trip Report
G104(K)_5/11/99_NM	G104(K)		5/11/1999	Dieldrin	0	ug/l		Solutia, 8/2000
G105(K)_5/11/99_NM	G105(K)		5/11/1999	Dieldrin	0	ug/l		Solutia, 8/2000
G106(99)_5/27/99_NM	G106(99)		5/27/1999	Dieldrin	0.0024	ug/l		IEPA, March 2000 Trip Report
G106(K)_5/11/99_DUP	G106(K)	G116(K)	5/11/1999	Dieldrin	0	ug/l		Solutia, 8/2000
G106(K)_5/11/99_NM	G106(K)		5/11/1999	Dieldrin	0	ug/l		Solutia, 8/2000
G107(99)_5/27/99_NM	G107(99)		5/27/1999	Dieldrin	0	ug/l		IEPA, March 2000 Trip Report
G107(K)_5/12/99_NM	G107(K)		5/12/1999	Dieldrin	0	ug/l		Solutia, 8/2000
G108(99)_5/25/99_NM	G108(99)		5/25/1999	Dieldrin	0	ug/l		IEPA, March 2000 Trip Report
G108(K)_5/11/99_NM	G108(K)		5/11/1999	Dieldrin	0	ug/l		Solutia, 8/2000
G108_3/18/87_NM	G108	DC-GW-18	3/18/1987	Dieldrin	0	ug/l		EEI 1998. Source is EEI 1988.
G109(99)_5/27/99_NM	G109(99)		5/27/1999	Dieldrin	0	ug/l		IEPA, March 2000 Trip Report
G109(K)_5/12/99_NM	G109(K)		5/12/1999	Dieldrin	0	ug/l		Solutia, 8/2000
G109_3/24/87_NM	G109	DC-GW-37	3/24/1987	Dieldrin	0	ug/l		EEI 1998. Source is EEI 1988.
G110(99)_5/26/99_NM	G110(99)		5/26/1999	Dieldrin	0	ug/l		IEPA, March 2000 Trip Report
G110(K)_5/13/99_NM	G110(K)		5/13/1999	Dieldrin	0.13	ug/l		Solutia, 8/2000
G110_3/24/87_NM	G110	DC-GW-36	3/24/1987	Dieldrin	0	ug/l		EEI 1998; Source is EEI 1988.
G111(99)_5/24/99_NM	G111(99)		5/24/1999	Dieldrin	0.0076	ug/l		IEPA, March 2000 Trip Report
G111(K)_5/12/99_NM	G111(K)		5/12/1999	Dieldrin	0	ug/l		Solutia, 8/2000
G112(99)_5/25/99_NM	G112(99)		5/25/1999	Dieldrin	0.0045	ug/l		IEPA, March 2000 Trip Report
G112(K)_5/13/99_NM	G112(K)		5/13/1999	Dieldrin	0	ug/l		Solutia, 8/2000
G112_3/23/87_NM	G112		3/23/1987	Dieldrin	0	ug/l		EEI 1998; Source is EEI 1988.
G113(99)_5/25/99_NM	G113(99)		5/25/1999	Dieldrin	0.0066	ug/l		IEPA, March 2000 Trip Report
G113(K)_5/13/99_NM	G113(K)		5/13/1999	Dieldrin	0	ug/l		Solutia, 8/2000
G114(99)_5/25/99_DUP	G114(99)	G115(99)	5/25/1999	Dieldrin	0	ug/l		IEPA, March 2000 Trip Report
G114(99)_5/25/99_NM	G114(99)		5/25/1999	Dieldrin	0	ug/l		IEPA, March 2000 Trip Report
G114(K)_5/12/99_NM	G114(K)		5/12/1999	Dieldrin	0	ug/l		Solutia, 8/2000
G115(K)_5/12/99_NM	G115(K)		5/12/1999	Dieldrin	0	ug/l		Solutia, 8/2000
G116(99)_5/26/99_NM	G116(99)		5/26/1999	Dieldrin	0	ug/l		IEPA, March 2000 Trip Report
G117(99)_5/27/99_NM	G117(99)		5/27/1999	Dieldrin	0	ug/l		IEPA, March 2000 Trip Report
GM-106_11/15/85_NM	GM-106		11/15/1985	Dieldrin	0	ug/l	2.6	EEI 1998. Source is G&M 1994.
GM-106_2/15/86_DUP	GM-106		2/15/1986	Dieldrin	0	ug/l	2.6	EEI 1998. Source is G&M 1994.
GM-106_2/15/86_NM	GM-106		2/15/1986	Dieldrin	0	ug/l	2.6	EEI 1998. Source is G&M 1994.
GM-106_6/8/92_DUP	GM-106		6/8/1992	Dieldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GM-106_6/8/92_NM	GM-106		6/8/1992	Dieldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GM-19A_11/15/84_NM	GM-19A		11/15/1984	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-19A_9/15/84_NM	GM-19A		9/15/1984	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-19B_11/15/84_NM	GM-19B		11/15/1984	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-19B_2/15/85_DUP	GM-19B		2/15/1985	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-19B_2/15/85_NM	GM-19B		2/15/1985	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-19B_9/15/84_NM	GM-19B		9/15/1984	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-19C_11/15/84_NM	GM-19C		11/15/1984	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.

SAMP_ID	Well_ID	Lab_ID	Coll_date	Analyte	Result	Units	RDL	Comment
GM-19C_2/15/85_NM	GM-19C		2/15/1985	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-19C_9/15/84_NM	GM-19C		9/15/1984	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-20A_2/15/86_NM	GM-20A		2/15/1986	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-20A_9/15/84_NM	GM-20A		9/15/1984	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-20B_2/15/85_NM	GM-20B		2/15/1985	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-20B_9/15/84_NM	GM-20B		9/15/1984	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-21A_2/15/86_NM	GM-21A		2/15/1986	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-21A_9/15/84_NM	GM-21A		9/15/1984	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-21B_2/15/85_NM	GM-21B		2/15/1985	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-21B_5/15/85_NM	GM-21B		5/15/1985	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-22A_2/15/85_NM	GM-22A		2/15/1985	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-22A_9/15/84_NM	GM-22A		9/15/1984	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-22B_2/15/85_DUP	GM-22B		2/15/1985	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-22B_2/15/85_NM	GM-22B		2/15/1985	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-22B_5/15/85_NM	GM-22B		5/15/1985	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-23_2/15/86_NM	GM-23		2/15/1986	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-23_9/15/84_NM	GM-23		9/15/1984	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-24A_11/15/84_NM	GM-24A		11/15/1984	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-24A_9/15/84_NM	GM-24A		9/15/1984	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-24B_11/15/84_NM	GM-24B		11/15/1984	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-24B_9/15/84_NM	GM-24B		9/15/1984	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-26A_2/15/86_NM	GM-26A		2/15/1986	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-26A_9/15/84_NM	GM-26A		9/15/1984	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-26B_2/15/85_NM	GM-26B		2/15/1985	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-26B_9/15/84_NM	GM-26B		9/15/1984	Dieldrin	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-27B_11/15/87_NM	GM-27B		11/15/1987	Dieldrin	0	ug/l	2.8	EEI 1998. Source is G&M 1990.
GM-27B_2/15/86_NM	GM-27B		2/15/1986	Dieldrin	0	ug/l	2.6	EEI 1998. Source is G&M 1994.
GM-27B_6/9/92_NM	GM-27B		6/9/1992	Dieldrin	0.17	ug/l		EEI 1998. Source is G&M 1994.
GM-27B_9/15/84_NM	GM-27B		9/15/1984	Dieldrin	0	ug/l	0.007	EEI 1998. Source is G&M 1994.
GM-27C_11/15/87_NM	GM-27C		11/15/1987	Dieldrin	0	ug/l	2.8	EEI 1998. Source is G&M 1990.
GM-27C_2/15/86_NM	GM-27C		2/15/1986	Dieldrin	0	ug/l	2.6	EEI 1998. Source is G&M 1994.
GM-27C_6/9/92_NM	GM-27C		6/9/1992	Dieldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GM-27C_9/15/84_NM	GM-27C		9/15/1984	Dieldrin	0	ug/l	0.07	EEI 1998. Source is G&M 1994.
GM-28B_11/15/87_NM	GM-28B		11/15/1987	Dieldrin	0	ug/l	250	EEI 1998. Source is G&M 1990.
GM-28B_2/15/86_NM	GM-28B		2/15/1986	Dieldrin	0	ug/l	2.6	EEI 1998. Source is G&M 1994.
GM-28B_3/15/89_NM	GM-28B		3/15/1989	Dieldrin	0	ug/l	26	EEI 1998. Source is G&M 1990.
GM-28B_6/5/92_NM	GM-28B		6/5/1992	Dieldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GM-28B_9/15/84_NM	GM-28B		9/15/1984	Dieldrin	0	ug/l	0.007	EEI 1998. Source is G&M 1994.
GM-28C_11/15/87_NM	GM-28C		11/15/1987	Dieldrin	0	ug/l	2.5	EEI 1998. Source is G&M 1990.
GM-28C_2/15/86_NM	GM-28C		2/15/1986	Dieldrin	0	ug/l	2.5	EEI 1998. Source is G&M 1994.
GM-28C_3/15/89_DUP	GM-28C		3/15/1989	Dieldrin	0	ug/l	250	EEI 1998. Source is G&M 1990.
GM-28C_3/15/89_NM	GM-28C		3/15/1989	Dieldrin	0	ug/l	2600	EEI 1998. Source is G&M 1990.
GM-28C_6/8/92_NM	GM-28C		6/8/1992	Dieldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GM-28C_9/15/84_NM	GM-28C		9/15/1984	Dieldrin	0	ug/l	0.7	EEI 1998. Source is G&M 1994.
GM-31A_11/15/87_DUP	GM-31A		11/15/1987	Dieldrin	0	ug/l	2.6	EEI 1998. Source is G&M 1990.
GM-31A_11/15/87_NM	GM-31A		11/15/1987	Dieldrin	0	ug/l	2.6	EEI 1998. Source is G&M 1990.
GM-54A_11/15/87_NM	GM-54A		11/15/1987	Dieldrin	0	ug/l	2.6	EEI 1998. Source is G&M 1988.
GM-54B_11/15/87_NM	GM-54B		11/15/1987	Dieldrin	0	ug/l	2.7	EEI 1998. Source is G&M 1988.
GM-55C_11/15/87_NM	GM-55C		11/15/1987	Dieldrin	0	ug/l	2.6	EEI 1998. Source is G&M 1990.
GM-55C_5/15/88_NM	GM-55C		5/15/1988	Dieldrin	0	ug/l	59	EEI 1998. Source is G&M 1990.
GM-55C_6/8/92_NM	GM-55C		6/8/1992	Dieldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GM-56C_11/15/87_NM	GM-56C		11/15/1987	Dieldrin	0	ug/l	260	EEI 1998. Source is G&M 1990.

SAMP_ID	Well_ID	Lab_ID	Coll_Date	Analyte	Result	Units	RDL	Comment
GM-56C_5/15/88_NM	GM-56C		5/15/1988	Dieldrin	0	ug/l	150	EEI 1998. Source is G&M 1990.
GM-56C_6/5/92_NM	GM-56C		6/5/1992	Dieldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GM-57C_11/15/87_DUP	GM-57C		11/15/1987	Dieldrin	0	ug/l	290	EEI 1998. Source is G&M 1990.
GM-57C_11/15/87_NM	GM-57C		11/15/1987	Dieldrin	0	ug/l	270	EEI 1998. Source is G&M 1990.
GM-57C_3/15/89_NM	GM-57C		3/15/1989	Dieldrin	0	ug/l	26	EEI 1998. Source is G&M 1990.
GM-57C_5/15/88_DUP	GM-57C		5/15/1988	Dieldrin	0	ug/l	130	EEI 1998. Source is G&M 1990.
GM-57C_5/15/88_NM	GM-57C		5/15/1988	Dieldrin	0	ug/l	130	EEI 1998. Source is G&M 1990.
GM-57C_6/5/92_NM	GM-57C		6/5/1992	Dieldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GM-58A_11/15/87_NM	GM-58A		11/15/1987	Dieldrin	0	ug/l	2.6	EEI 1998. Source is G&M 1990.
GM-58A_5/15/88_NM	GM-58A		5/15/1988	Dieldrin	0	ug/l	2.8	EEI 1998. Source is G&M 1990.
GM-59A_11/15/87_NM	GM-59A		11/15/1987	Dieldrin	0	ug/l	2.6	EEI 1998. Source is G&M 1990.
GM-59A_5/15/88_NM	GM-59A		5/15/1988	Dieldrin	0	ug/l	2.5	EEI 1998. Source is G&M 1990.
GM-62A_11/15/88_NM	GM-62A		11/15/1988	Dieldrin	0	ug/l	2.8	EEI 1998. Source is G&M 1994.
GM-62A_6/10/92_NM	GM-62A		6/10/1992	Dieldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GM-62A_8/15/88_NM	GM-62A		8/15/1988	Dieldrin	0	ug/l	2.7	EEI 1998. Source is G&M 1994.
GM-62B_11/15/88_DUP	GM-62B		11/15/1988	Dieldrin	0	ug/l	10	EEI 1998. Source is G&M 1994.
GM-62B_11/15/88_NM	GM-62B		11/15/1988	Dieldrin	0	ug/l	2.6	EEI 1998. Source is G&M 1994.
GM-62B_6/9/92_DUP	GM-62B		6/9/1992	Dieldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GM-62B_6/9/92_NM	GM-62B		6/9/1992	Dieldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GM-62B_8/15/88_DUP	GM-62B		8/15/1988	Dieldrin	0	ug/l	2.7	EEI 1998. Source is G&M 1994.
GM-62B_8/15/88_NM	GM-62B		8/15/1988	Dieldrin	0	ug/l	2.8	EEI 1998. Source is G&M 1994.
GM-62C_11/15/88_NM	GM-62C		11/15/1988	Dieldrin	0	ug/l	2.7	EEI 1998. Source is G&M 1994.
GM-62C_6/9/92_NM	GM-62C		6/9/1992	Dieldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GM-65A_6/10/92_NM	GM-65A		6/10/1992	Dieldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GM-66A_6/11/92_NM	GM-66A		6/11/1992	Dieldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GM-66B_6/11/92_NM	GM-66B		6/11/1992	Dieldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GM-66C_6/10/92_DUP	GM-66C		6/10/1992	Dieldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GM-66C_6/10/92_NM	GM-66C		6/10/1992	Dieldrin	0	ug/l		EEI 1998. Source is G&M 1994.
GW-56_3/26/87_NM	GW-56	DC-GW-56	3/26/1987	Dieldrin	0	ug/l		Need RDL; Source is EEI 1988.
KEARBY_3/28/91_NM	KEARBY	G204	3/28/1991	Dieldrin	0	ug/l		EEI 1998; CERCLA SSIR, AREA 1
MCDONALD_3/26/87_NM	MCDONALD		3/26/1987	Dieldrin	0	ug/l		EEI 1998. Source is EEI 1988.
P-1_11/15/87_NM	P-1		11/15/1987	Dieldrin	0	ug/l	2.7	EEI 1998. Source is G&M 1990.
P-1_3/25/87_NM	P-1	DC-GW-44	3/25/1987	Dieldrin	0	ug/l	2.8	Source is G&M 1990.
P-1_6/3/92_NM	P-1		6/3/1992	Dieldrin	0	ug/l		EEI 1998. Source is G&M 1994.
P-1_9/15/84_NM	P-1		9/15/1984	Dieldrin	0	ug/l	0.14	EEI 1998. Source is G&M 1990.
P-10_11/15/87_NM	P-10		11/15/1987	Dieldrin	0	ug/l	250	EEI 1998. Source is G&M 1990.
P-10_6/4/92_NM	P-10		6/4/1992	Dieldrin	0	ug/l		EEI 1998. Source is G&M 1994.
P-10_9/15/84_NM	P-10		9/15/1984	Dieldrin	0	ug/l	70	EEI 1998. Source is G&M 1994.
P-11_11/15/87_NM	P-11		11/15/1987	Dieldrin	0	ug/l	2.6	EEI 1998. Source is G&M 1990.
P-11_3/15/87_NM	P-11		3/15/1987	Dieldrin	0	ug/l	2.7	EEI 1998. Source is G&M 1990.
P-11_3/25/87_NM	P-11	DC-GW-50	3/25/1987	Dieldrin	0	ug/l		Need RDL; Source is EEI 1988.
P-11_6/4/92_NM	P-11		6/4/1992	Dieldrin	0	ug/l		EEI 1998. Source is G&M 1994.
P-11_9/15/84_NM	P-11		9/15/1984	Dieldrin	0.018	ug/l		EEI 1998. Source is G&M 1994.
P-12_11/15/87_NM	P-12		11/15/1987	Dieldrin	0	ug/l	2.5	EEI 1998. Source is G&M 1990.
P-12_6/4/92_NM	P-12		6/4/1992	Dieldrin	0	ug/l		EEI 1998. Source is G&M 1994.
P-12_9/15/84_NM	P-12		9/15/1984	Dieldrin	0	ug/l	0.07	EEI 1998. Source is G&M 1990.
P-13_11/15/87_NM	P-13		11/15/1987	Dieldrin	0	ug/l	2.5	EEI 1998. Source is G&M 1990.
P-13_6/15/84_DUP	P-13		6/15/1984	Dieldrin	0	ug/l	10	EEI 1998. Source is EEI 1988.
P-13_6/15/84_DUP	P-13		6/15/1984	Dieldrin	0	ug/l	10	EEI 1998. Source is EEI 1988.
P-13_6/15/84_NM	P-13		6/15/1984	Dieldrin	0	ug/l	10	EEI 1998. Source is EEI 1988.
P-14_11/15/87_NM	P-14		11/15/1987	Dieldrin	0	ug/l	2.5	EEI 1998. Source is G&M 1990.
P-14_6/15/84_NM	P-14		6/15/1984	Dieldrin	0	ug/l	10	EEI 1998. Source is EEI 1988.

SAMP_ID	Well_ID	Lab_ID	Coll_date	Analyte	Result	Units	RDL	Comment
P-14_6/5/92_NM	P-14		6/5/1992	Dieldrin	0	ug/l		EEI 1998. Source is G&M 1994.
P-2_11/15/87_NM	P-2		11/15/1987	Dieldrin	0	ug/l	2.6	EEI 1998. Source is G&M 1990.
P-2_6/15/84_NM	P-2		6/15/1984	Dieldrin	0	ug/l	10	EEI 1998. Source is G&M 1994.
P-2_6/3/92_NM	P-2		6/3/1992	Dieldrin	0	ug/l		EEI 1998. Source is G&M 1994.
P-3_11/15/87_NM	P-3		11/15/1987	Dieldrin	0	ug/l	2.5	EEI 1998. Source is G&M 1990.
P-3_6/3/92_NM	P-3		6/3/1992	Dieldrin	0	ug/l		EEI 1998. Source is G&M 1994.
P-6_11/15/87_NM	P-6		11/15/1987	Dieldrin	0	ug/l	1.9	EEI 1998. Source is G&M 1990.
P-6_6/15/84_NM	P-6		6/15/1984	Dieldrin	0	ug/l	10	EEI 1998. Source is G&M 1994.
P-6_6/3/92_NM	P-6		6/3/1992	Dieldrin	0	ug/l		EEI 1998. Source is G&M 1994.
P-7_11/15/87_NM	P-7		11/15/1987	Dieldrin	0	ug/l	2.6	EEI 1998. Source is G&M 1994.
P-7_3/15/89_NM	P-7		3/15/1989	Dieldrin	0	ug/l	26	EEI 1998. Source is G&M 1994.
P-7_3/25/87_NM	P-7	GW-46	3/25/1987	Dieldrin	0	ug/l	2.7	EEI 1998. Source is G&M 1994.
P-7_6/15/84_NM	P-7		6/15/1984	Dieldrin	0	ug/l	10	EEI 1998. Source is G&M 1990.
P-7_6/4/92_NM	P-7		6/4/1992	Dieldrin	0	ug/l		EEI 1998. Source is G&M 1994.
P-8_11/15/87_NM	P-8		11/15/1987	Dieldrin	0	ug/l	250	EEI 1998. Source is G&M 1990.
P-8_3/15/89_NM	P-8		3/15/1989	Dieldrin	0	ug/l	1300	EEI 1998. Source is G&M 1990.
P-8_6/15/84_NM	P-8		6/15/1984	Dieldrin	0	ug/l	10	EEI 1998. Source is G&M 1994.
P-8_6/4/92_NM	P-8		6/4/1992	Dieldrin	0	ug/l		EEI 1998. Source is G&M 1994.
SCHMIDT_3/26/87_NM	SCHMIDT	G202	3/26/1987	Dieldrin	0	ug/l		EEI 1998. Source is EEI 1988.
SCHMIDT_3/27/91_NM	SCHMIDT	G202	3/27/1991	Dieldrin	0	ug/l		EEI 1998; CERCLA SSIR, AREA 1
SETTLES_3/26/87_NM	SETTLES	G201	3/26/1987	Dieldrin	0	ug/l		EEI 1998. Source is EEI 1988.
SETTLES_3/27/91_NM	SETTLES	G201	3/27/1991	Dieldrin	0	ug/l		EEI 1998; CERCLA SSIR, AREA 1
WRIGHT_3/26/87_NM	WRIGHT		3/26/1987	Dieldrin	0	ug/l		EEI 1998. Source is EEI 1988.
ALLEN_3/27/91_NM	ALLEN	G205; S06	3/27/1991	Total PCBs	0	ug/l		EEI 1998; CERCLA SSIR, AREA 1
ALLEN_3/27/91_NM	ALLEN	G205; S06	3/27/1991	Total PCBs	0	ug/l		EEI 1998; CERCLA SSIR, AREA 1
B-24A_2/15/86_NM	B-24A		2/15/1986	Total PCBs	0	ug/l	37	EEI 1998. Source is G&M 1994.
B-25A_3/15/87_NM	B-25A		3/15/1987	Total PCBs	0	ug/l	4000	EEI 1998. Source is G&M 1990.
B-25A_3/25/87_NM	B-25A	DC-GW-49	3/25/1987	Total PCBs	0	ug/l		Need RDL; Source is EEI 1988.
B-25A_6/15/84_NM	B-25A		6/15/1984	Total PCBs	0	ug/l	50	EEI 1998. Source is G&M 1994.
B-25B_6/15/84_NM	B-25B		6/15/1984	Total PCBs	0	ug/l	50	EEI 1998. Source is G&M 1994.
B-26A_3/15/87_NM	B-26A		3/15/1987	Total PCBs	0	ug/l	40	EEI 1998. Source is G&M 1990.
B-26A_3/25/87_DUP	B-26A	GW-48	3/25/1987	Total PCBs	0	ug/l		EEI 1998. Source is G&M 1990.
B-26A_3/25/87_NM	B-26A	GW-47	3/25/1987	Total PCBs	0	ug/l		EEI 1998. Source is G&M 1990.
B-27B_9/15/84_NM	B-27B		9/15/1984	Total PCBs	0	ug/l	82	EEI 1998. Source is G&M 1990.
B-28A_2/15/86_NM	B-28A		2/15/1986	Total PCBs	0	ug/l	38	EEI 1998. Source is G&M 1990.
B-28A_3/15/87_NM	B-28A		3/15/1987	Total PCBs	0	ug/l	39	EEI 1998. Source is G&M 1990.
B-28A_3/25/87_NM	B-28A	DC-GW-45	3/25/1987	Total PCBs	0	ug/l		Need RDL; Source is EEI 1988.
B-29A_6/15/84_NM	B-29A		6/15/1984	Total PCBs	0	ug/l	50	EEI 1998. Source is G&M 1994.
B-29B_11/15/84_NM	B-29B		11/15/1984	Total PCBs	0	ug/l	50	EEI 1998. Source is G&M 1994.
B-29B_6/15/84_DUP	B-29B		6/15/1984	Total PCBs	0	ug/l	50	EEI 1998. Source is G&M 1994.
B-29B_6/15/84_DUP	B-29B		6/15/1984	Total PCBs	0	ug/l	100	EEI 1998. Source is G&M 1994.
B-29B_6/15/84_NM	B-29B		6/15/1984	Total PCBs	0	ug/l	50	EEI 1998. Source is G&M 1994.
BALLET_3/27/91_NM	BALLET	G203	3/27/1991	Total PCBs	0	ug/l		EEI 1998; CERCLA SSIR, AREA 1
DW-35_2/15/85_NM	DW-35		2/15/1985	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
DW-35_5/15/85_NM	DW-35		5/15/1985	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
DW-36_2/15/85_NM	DW-36		2/15/1985	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
DW-36_5/15/85_NM	DW-36		5/15/1985	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
DW-A_11/15/85_NM	DW-A		11/15/1985	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
DW-A_2/15/86_NM	DW-A		2/15/1986	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
EE-01_3/17/87_NM	EE-01	DC-GW-10	3/17/1987	Total PCBs	52	ug/l		EEI 1998; Source is EEI 1988.
EE-02_3/17/87_NM	EE-02	DC-GW-11	3/17/1987	Total PCBs	0	ug/l		EEI 1998; Source is EEI 1988.
EE-03_3/17/87_NM	EE-03	DC-GW-12	3/17/1987	Total PCBs	0	ug/l		EEI 1998; Source is EEI 1988.

SAMP_ID	Well_ID	Lab_ID	Coll_date	Analyte	Result	Units	SDL	Comment
EE-04_3/17/87_NM	EE-04	DC-GW-13	3/17/1987	Total PCBs	0	ug/l		EEI 1998; Source is EEI 1988.
EE-06_3/16/87_NM	EE-06	DC-GW-01	3/16/1987	Total PCBs	0	ug/l		Need RDL; Source is EEI 1988.
EE-07_3/16/87_NM	EE-07	DC-GW-02	3/16/1987	Total PCBs	0	ug/l		Need RDL; Source is EEI 1988.
EE-08_3/16/87_NM	EE-08	DC-GW--06	3/16/1987	Total PCBs	0	ug/l		Need RDL; Source is EEI 1988.
EE-09_3/16/87_NM	EE-09	DC-GW-03	3/16/1987	Total PCBs	0	ug/l		Need RDL; Source is EEI 1988.
EE-10_3/16/87_NM	EE-10	DC-GW-04	3/16/1987	Total PCBs	0	ug/l		Need RDL; Source is EEI 1988.
EE-12_3/23/87_DUP	EE-12	DC-GW-29	3/23/1987	Total PCBs	0	ug/l		EEI 1998; Source is EEI 1988.
EE-12_3/23/87_NM	EE-12	DC-GW-24	3/23/1987	Total PCBs	0	ug/l		EEI 1998; Source is EEI 1988.
EE-13_3/23/87_NM	EE-13	DC-GW-23	3/23/1987	Total PCBs	0	ug/l		EEI 1998; Source is EEI 1988.
EE-14_3/23/87_NM	EE-14	DC-GW-26	3/23/1987	Total PCBs	0	ug/l		EEI 1998; Source is EEI 1988.
EE-15_3/23/87_NM	EE-15	DC-GW-27	3/23/1987	Total PCBs	0	ug/l		EEI 1998; Source is EEI 1988.
EE-16_3/23/87_NM	EE-16	DC-GW-28	3/23/1987	Total PCBs	0	ug/l		EEI 1998; Source is EEI 1988.
EE-17_3/16/87_NM	EE-17	DC-GW-05	3/16/1987	Total PCBs	0	ug/l		Need RDL; Source is EEI 1988.
EE-18_3/16/87_NM	EE-18	DC-GW-09	3/16/1987	Total PCBs	0	ug/l		Need RDL; Source is EEI 1988.
EE-19_3/16/87_DUP	EE-19	DC-GW-08	3/16/1987	Total PCBs	0	ug/l		Need RDL; Source is EEI 1988.
EE-19_3/16/87_NM	EE-19	DC-GW-07	3/16/1987	Total PCBs	0	ug/l		Need RDL; Source is EEI 1988.
EE-20_3/23/87_NM	EE-20	DC-GW-31	3/23/1987	Total PCBs	0	ug/l		EEI 1998; Source is EEI 1988.
EE-21_3/24/87_NM	EE-21	DC-GW-38	3/24/1987	Total PCBs	0	ug/l	41	Source is EEI 1988.
EE-21_7/14/87_NM	EE-21	DC-GW-38A	7/14/1987	Total PCBs	0	ug/l	37	Source is EEI 1988.
EE-22_3/24/87_NM	EE-22	DC-GW-39	3/24/1987	Total PCBs	0	ug/l	8000	Source is EEI 1988.
EE-22_7/14/87_NM	EE-22	DC-GW-39A	7/14/1987	Total PCBs	0	ug/l	380	Source is EEI 1988.
EE-23_3/24/87_NM	EE-23	DC-GW-40	3/24/1987	Total PCBs	0	ug/l	40	Source is EEI 1988.
EE-23_7/14/87_NM	EE-23	DC-GW-40A	7/14/1987	Total PCBs	0	ug/l	38	Source is EEI 1988.
EE-24_3/24/87_DUP	EE-24	DC-GW-42	3/24/1987	Total PCBs	0	ug/l	40	Source is EEI 1988.
EE-24_3/24/87_NM	EE-24	DC-GW-41	3/24/1987	Total PCBs	0	ug/l	40	Source is EEI 1988.
EE-24_7/14/87_NM	EE-24	DC-GW-41A	7/14/1987	Total PCBs	0	ug/l	37	Source is EEI 1988.
EE-25_3/24/87_NM	EE-25	DC-GW-43	3/24/1987	Total PCBs	0	ug/l	41	Source is EEI 1988.
EE-25_7/14/87_NM	EE-25	DC-GW-43A	7/14/1987	Total PCBs	0	ug/l	38	Source is EEI 1988.
G101(99)_5/24/99_NM	G101(99)		5/24/1999	Total PCBs	0	ug/l		IEPA, March 2000 Trip Report
G101(K)_5/10/99_NM	G101(K)		5/10/1999	Total PCBs	0	ug/l		Solutia, 8/2000
G101_10/23/80_NM	G101		10/23/1980	Total PCBs	1	ug/l		EEI 1998. Source is EEI 1986.
G101_3/11/81_NM	G101		3/11/1981	Total PCBs	0.13	ug/l		EEI 1998. Source is EEI 1986.
G102(99)_5/24/99_NM	G102(99)		5/24/1999	Total PCBs	0	ug/l		IEPA, March 2000 Trip Report
G102(K)_5/10/99_NM	G102(K)		5/10/1999	Total PCBs	0	ug/l		Solutia, 8/2000
G102_10/23/80_NM	G102		10/23/1980	Total PCBs	1.2	ug/l		EEI 1998. Source is EEI 1986.
G102_3/10/81_NM	G102		3/10/1981	Total PCBs	0.46	ug/l		EEI 1998. Source is EEI 1986.
G103(99)_5/24/99_NM	G103(99)		5/24/1999	Total PCBs	0.34	ug/l		IEPA, March 2000 Trip Report
G103(K)_5/10/99_NM	G103(K)		5/10/1999	Total PCBs	0	ug/l		Solutia, 8/2000
G103_10/23/80_NM	G103		10/23/1980	Total PCBs	0	ug/l		EEI 1998. Source is EEI 1986.
G103_3/10/81_NM	G103		3/10/1981	Total PCBs	0	ug/l	0.1	EEI 1998. Source is EEI 1986.
G104(99)_5/26/99_NM	G104(99)		5/26/1999	Total PCBs	0	ug/l		IEPA, March 2000 Trip Report
G104(K)_5/11/99_NM	G104(K)		5/11/1999	Total PCBs	0	ug/l		Solutia, 8/2000
G104_10/23/80_NM	G104		10/23/1980	Total PCBs	0	ug/l		EEI 1998. Source is EEI 1986.
G104_3/10/81_NM	G104		3/10/1981	Total PCBs	0.1	ug/l		EEI 1998. Source is EEI 1986.
G105(K)_5/11/99_NM	G105(K)		5/11/1999	Total PCBs	0	ug/l		Solutia, 8/2000
G105_10/23/80_NM	G105		10/23/1980	Total PCBs	0	ug/l		EEI 1998. Source is EEI 1986.
G105_3/10/81_NM	G105		3/10/1981	Total PCBs	0	ug/l	0.1	EEI 1998. Source is EEI 1986.
G106(99)_5/27/99_NM	G106(99)		5/27/1999	Total PCBs	4.06	ug/l		IEPA, March 2000 Trip Report
G106(K)_5/11/99_DUP	G106(K)	G116(K)	5/11/1999	Total PCBs	0	ug/l		Solutia, 8/2000
G106(K)_5/11/99_NM	G106(K)		5/11/1999	Total PCBs	0	ug/l		Solutia, 8/2000
G106_10/23/80_NM	G106		10/23/1980	Total PCBs	0	ug/l		EEI 1998. Source is EEI 1986.
G106_3/11/81_NM	G106		3/11/1981	Total PCBs	3.4	ug/l		EEI 1998. Source is EEI 1986.

SAMP_ID	Well_ID	Lab_ID	Coll_date	Analyte	Result	Units	RDL	Comment
G107(99)_5/27/99_NM	G107(99)		5/27/1999	Total PCBs	82.8	ug/l		IEPA, March 2000 Trip Report
G107(K)_5/12/99_NM	G107(K)		5/12/1999	Total PCBs	0	ug/l		Solutia, 8/2000
G107_10/23/80_NM	G107		10/23/1980	Total PCBs	0	ug/l		EEI 1998. Source is EEI 1986.
G107_3/11/81_NM	G107		3/11/1981	Total PCBs	0.37	ug/l		EEI 1998. Source is EEI 1986.
G108(99)_5/25/99_NM	G108(99)		5/25/1999	Total PCBs	1.3	ug/l		IEPA, March 2000 Trip Report
G108(K)_5/11/99_NM	G108(K)		5/11/1999	Total PCBs	0	ug/l		Solutia, 8/2000
G108_10/23/80_NM	G108		10/23/1980	Total PCBs	0	ug/l		EEI 1998. Source is EEI 1986.
G108_3/10/81_NM	G108		3/10/1981	Total PCBs	0	ug/l	0.1	EEI 1998. Source is EEI 1986.
G108_3/18/87_NM	G108	DC-GW-18	3/18/1987	Total PCBs	0	ug/l		EEI 1998. Source is EEI 1988.
G109(99)_5/27/99_NM	G109(99)		5/27/1999	Total PCBs	1.29	ug/l		IEPA, March 2000 Trip Report
G109(K)_5/12/99_NM	G109(K)		5/12/1999	Total PCBs	0	ug/l		Solutia, 8/2000
G109_10/23/80_NM	G109		10/23/1980	Total PCBs	0	ug/l		EEI 1998. Source is EEI 1986.
G109_3/11/81_NM	G109		3/11/1981	Total PCBs	0	ug/l	0.1	EEI 1998. Source is EEI 1986.
G109_3/24/87_NM	G109	DC-GW-37	3/24/1987	Total PCBs	0	ug/l		EEI 1998. Source is EEI 1988.
G110(99)_5/26/99_NM	G110(99)		5/26/1999	Total PCBs	0.087	ug/l		IEPA, March 2000 Trip Report
G110(K)_5/13/99_NM	G110(K)		5/13/1999	Total PCBs	0	ug/l		Solutia, 8/2000
G110_10/23/80_NM	G110		10/23/1980	Total PCBs	0	ug/l		EEI 1998. Source is EEI 1986.
G110_3/10/81_NM	G110		3/10/1981	Total PCBs	0.9	ug/l		EEI 1998. Source is EEI 1986.
G110_3/24/87_NM	G110	DC-GW-36	3/24/1987	Total PCBs	0	ug/l		EEI 1998; Source is EEI 1988.
G111(99)_5/24/99_NM	G111(99)		5/24/1999	Total PCBs	0	ug/l		IEPA, March 2000 Trip Report
G111(K)_5/12/99_NM	G111(K)		5/12/1999	Total PCBs	0	ug/l		Solutia, 8/2000
G111_10/23/80_NM	G111		10/23/1980	Total PCBs	0	ug/l		EEI 1998. Source is EEI 1986.
G111_3/10/81_NM	G111		3/10/1981	Total PCBs	0	ug/l	0.1	EEI 1998. Source is EEI 1986.
G112(99)_5/25/99_NM	G112(99)		5/25/1999	Total PCBs	0	ug/l		IEPA, March 2000 Trip Report
G112(K)_5/13/99_NM	G112(K)		5/13/1999	Total PCBs	0	ug/l		Solutia, 8/2000
G112_10/23/80_NM	G112		10/23/1980	Total PCBs	0	ug/l		EEI 1998. Source is EEI 1986.
G112_3/10/81_NM	G112		3/10/1981	Total PCBs	2	ug/l		EEI 1998. Source is EEI 1986.
G112_3/23/87_NM	G112		3/23/1987	Total PCBs	0	ug/l		EEI 1998; Source is EEI 1988.
G113(99)_5/25/99_NM	G113(99)		5/25/1999	Total PCBs	0	ug/l		IEPA, March 2000 Trip Report
G113(K)_5/13/99_NM	G113(K)		5/13/1999	Total PCBs	0	ug/l		Solutia, 8/2000
G114(99)_5/25/99_DUP	G114(99)	G115(99)	5/25/1999	Total PCBs	0	ug/l		IEPA, March 2000 Trip Report
G114(99)_5/25/99_NM	G114(99)		5/25/1999	Total PCBs	0	ug/l		IEPA, March 2000 Trip Report
G114(K)_5/12/99_NM	G114(K)		5/12/1999	Total PCBs	0	ug/l		Solutia, 8/2000
G115(K)_5/12/99_NM	G115(K)		5/12/1999	Total PCBs	0	ug/l		Solutia, 8/2000
G116(99)_5/26/99_NM	G116(99)		5/26/1999	Total PCBs	0	ug/l		IEPA, March 2000 Trip Report
G117(99)_5/27/99_NM	G117(99)		5/27/1999	Total PCBs	18.9	ug/l		IEPA, March 2000 Trip Report
G504_9/16/80_NM	G504		9/16/1980	Total PCBs	0	ug/l		EEI 1998; Source is CERCLA PA Report
G505_9/16/80_NM	G505		9/16/1980	Total PCBs	0	ug/l		EEI 1998; Source is CERCLA PA Report.
GM-106_11/15/85_NM	GM-106		11/15/1985	Total PCBs	0	ug/l	37	EEI 1998. Source is G&M 1994.
GM-106_2/15/86_DUP	GM-106		2/15/1986	Total PCBs	0	ug/l	37	EEI 1998. Source is G&M 1994.
GM-106_2/15/86_NM	GM-106		2/15/1986	Total PCBs	0	ug/l	37	EEI 1998. Source is G&M 1994.
GM-106_6/8/92_DUP	GM-106		6/8/1992	Total PCBs	0	ug/l		EEI 1998. Source is G&M 1994.
GM-106_6/8/92_NM	GM-106		6/8/1992	Total PCBs	0	ug/l		EEI 1998. Source is G&M 1994.
GM-19A_11/15/84_NM	GM-19A		11/15/1984	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-19A_9/15/84_NM	GM-19A		9/15/1984	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-19B_11/15/84_NM	GM-19B		11/15/1984	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-19B_2/15/85_DUP	GM-19B		2/15/1985	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-19B_2/15/85_NM	GM-19B		2/15/1985	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-19B_9/15/84_NM	GM-19B		9/15/1984	Total PCBs	2.5	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-19C_11/15/84_NM	GM-19C		11/15/1984	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-19C_2/15/85_NM	GM-19C		2/15/1985	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-19C_9/15/84_NM	GM-19C		9/15/1984	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.

SAMP_ID	Well_ID	Lab_ID	Coll_Date	Analyte	Result	Units	RDL	Comment
GM-20A_2/15/86_NM	GM-20A		2/15/1986	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-20A_9/15/84_NM	GM-20A		9/15/1984	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-20B_2/15/85_NM	GM-20B		2/15/1985	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-20B_9/15/84_NM	GM-20B		9/15/1984	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-21A_2/15/86_NM	GM-21A		2/15/1986	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-21A_9/15/84_NM	GM-21A		9/15/1984	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-21B_2/15/85_NM	GM-21B		2/15/1985	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-21B_5/15/85_NM	GM-21B		5/15/1985	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-22A_2/15/85_NM	GM-22A		2/15/1985	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-22A_9/15/84_NM	GM-22A		9/15/1984	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-22B_2/15/85_DUP	GM-22B		2/15/1985	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-22B_2/15/85_NM	GM-22B		2/15/1985	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-22B_5/15/85_NM	GM-22B		5/15/1985	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-23_2/15/86_NM	GM-23		2/15/1986	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-23_9/15/84_NM	GM-23		9/15/1984	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-24A_11/15/84_NM	GM-24A		11/15/1984	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-24A_9/15/84_NM	GM-24A		9/15/1984	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-24B_11/15/84_NM	GM-24B		11/15/1984	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-24B_9/15/84_NM	GM-24B		9/15/1984	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-26A_2/15/86_NM	GM-26A		2/15/1986	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-26A_9/15/84_NM	GM-26A		9/15/1984	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-26B_2/15/85_NM	GM-26B		2/15/1985	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-26B_9/15/84_NM	GM-26B		9/15/1984	Total PCBs	0	ug/l		Need RDL; EEI 1998. Source is G&M 1988.
GM-27B_11/15/87_NM	GM-27B		11/15/1987	Total PCBs	0	ug/l	41	EEI 1998. Source is G&M 1990.
GM-27B_2/15/86_NM	GM-27B		2/15/1986	Total PCBs	0	ug/l	37	EEI 1998. Source is G&M 1994.
GM-27B_6/9/92_NM	GM-27B		6/9/1992	Total PCBs	0	ug/l		EEI 1998. Source is G&M 1994.
GM-27B_9/15/84_NM	GM-27B		9/15/1984	Total PCBs	0	ug/l	0.082	EEI 1998. Source is G&M 1994.
GM-27C_11/15/87_NM	GM-27C		11/15/1987	Total PCBs	0	ug/l	41	EEI 1998. Source is G&M 1990.
GM-27C_2/15/86_NM	GM-27C		2/15/1986	Total PCBs	0	ug/l	37	EEI 1998. Source is G&M 1994.
GM-27C_6/9/92_NM	GM-27C		6/9/1992	Total PCBs	0	ug/l		EEI 1998. Source is G&M 1994.
GM-27C_9/15/84_NM	GM-27C		9/15/1984	Total PCBs	0	ug/l	0.082	EEI 1998. Source is G&M 1994.
GM-28B_11/15/87_NM	GM-28B		11/15/1987	Total PCBs	0	ug/l	3600	EEI 1998. Source is G&M 1990.
GM-28B_2/15/86_NM	GM-28B		2/15/1986	Total PCBs	0	ug/l	37	EEI 1998. Source is G&M 1994.
GM-28B_3/15/89_NM	GM-28B		3/15/1989	Total PCBs	0	ug/l	370	EEI 1998. Source is G&M 1990.
GM-28B_6/5/92_NM	GM-28B		6/5/1992	Total PCBs	0	ug/l		EEI 1998. Source is G&M 1994.
GM-28B_9/15/84_NM	GM-28B		9/15/1984	Total PCBs	0	ug/l	0.082	EEI 1998. Source is G&M 1994.
GM-28C_11/15/87_NM	GM-28C		11/15/1987	Total PCBs	0	ug/l	36	EEI 1998. Source is G&M 1990.
GM-28C_2/15/86_NM	GM-28C		2/15/1986	Total PCBs	0	ug/l	36	EEI 1998. Source is G&M 1994.
GM-28C_3/15/89_DUP	GM-28C		3/15/1989	Total PCBs	0	ug/l	3600	EEI 1998. Source is G&M 1990.
GM-28C_3/15/89_NM	GM-28C		3/15/1989	Total PCBs	0	ug/l	37000	EEI 1998. Source is G&M 1990.
GM-28C_6/8/92_NM	GM-28C		6/8/1992	Total PCBs	0	ug/l		EEI 1998. Source is G&M 1994.
GM-28C_9/15/84_NM	GM-28C		9/15/1984	Total PCBs	0	ug/l	0.82	EEI 1998. Source is G&M 1994.
GM-31A_11/15/87_DUP	GM-31A		11/15/1987	Total PCBs	0	ug/l	38	EEI 1998. Source is G&M 1990.
GM-31A_11/15/87_NM	GM-31A		11/15/1987	Total PCBs	0	ug/l	38	EEI 1998. Source is G&M 1990.
GM-54A_11/15/87_NM	GM-54A		11/15/1987	Total PCBs	0	ug/l	38	EEI 1998. Source is G&M 1988.
GM-54B_11/15/87_NM	GM-54B		11/15/1987	Total PCBs	0	ug/l	39	EEI 1998. Source is G&M 1988.
GM-55C_11/15/87_NM	GM-55C		11/15/1987	Total PCBs	0	ug/l	38	EEI 1998. Source is G&M 1990.
GM-55C_5/15/88_NM	GM-55C		5/15/1988	Total PCBs	0	ug/l	850	EEI 1998. Source is G&M 1990.
GM-55C_6/8/92_NM	GM-55C		6/8/1992	Total PCBs	0	ug/l		EEI 1998. Source is G&M 1994.
GM-56C_11/15/87_NM	GM-56C		11/15/1987	Total PCBs	0	ug/l	3700	EEI 1998. Source is G&M 1990.
GM-56C_5/15/88_NM	GM-56C		5/15/1988	Total PCBs	0	ug/l	2200	EEI 1998. Source is G&M 1990.
GM-56C_6/5/92_NM	GM-56C		6/5/1992	Total PCBs	0	ug/l		EEI 1998. Source is G&M 1994.

SAMP_ID	Well_ID	Lab_ID	Col_date	Analyte	Result	Units	RDL	Comment
GM-57C_11/15/87_DUP	GM-57C		11/15/1987	Total PCBs	0	ug/l	4100	EEI 1998. Source is G&M 1990.
GM-57C_11/15/87_NM	GM-57C		11/15/1987	Total PCBs	0	ug/l	4000	EEI 1998. Source is G&M 1990.
GM-57C_3/15/89_NM	GM-57C		3/15/1989	Total PCBs	0	ug/l	380	EEI 1998. Source is G&M 1990.
GM-57C_5/15/88_DUP	GM-57C		5/15/1988	Total PCBs	0	ug/l	1900	EEI 1998. Source is G&M 1990.
GM-57C_5/15/88_NM	GM-57C		5/15/1988	Total PCBs	0	ug/l	1800	EEI 1998. Source is G&M 1990.
GM-57C_6/5/92_NM	GM-57C		6/5/1992	Total PCBs	0	ug/l		EEI 1998. Source is G&M 1994.
GM-58A_11/15/87_NM	GM-58A		11/15/1987	Total PCBs	0	ug/l	37	EEI 1998. Source is G&M 1990.
GM-58A_5/15/88_NM	GM-58A		5/15/1988	Total PCBs	0	ug/l	41	EEI 1998. Source is G&M 1990.
GM-59A_11/15/87_NM	GM-59A		11/15/1987	Total PCBs	0	ug/l	37	EEI 1998. Source is G&M 1990.
GM-59A_5/15/88_NM	GM-59A		5/15/1988	Total PCBs	0	ug/l	36	EEI 1998. Source is G&M 1990.
GM-62A_11/15/88_NM	GM-62A		11/15/1988	Total PCBs	0	ug/l	41	EEI 1998. Source is G&M 1994.
GM-62A_6/10/92_NM	GM-62A		6/10/1992	Total PCBs	0	ug/l		EEI 1998. Source is G&M 1994.
GM-62A_8/15/88_NM	GM-62A		8/15/1988	Total PCBs	0	ug/l	38	EEI 1998. Source is G&M 1994.
GM-62B_11/15/88_DUP	GM-62B		11/15/1988	Total PCBs	0	ug/l	50	EEI 1998. Source is G&M 1994.
GM-62B_11/15/88_NM	GM-62B		11/15/1988	Total PCBs	0	ug/l	37	EEI 1998. Source is G&M 1994.
GM-62B_6/9/92_DUP	GM-62B		6/9/1992	Total PCBs	0	ug/l		EEI 1998. Source is G&M 1994.
GM-62B_6/9/92_NM	GM-62B		6/9/1992	Total PCBs	0	ug/l		EEI 1998. Source is G&M 1994.
GM-62B_8/15/88_DUP	GM-62B		8/15/1988	Total PCBs	0	ug/l	38	EEI 1998. Source is G&M 1994.
GM-62B_8/15/88_NM	GM-62B		8/15/1988	Total PCBs	0	ug/l	41	EEI 1998. Source is G&M 1994.
GM-62C_11/15/88_NM	GM-62C		11/15/1988	Total PCBs	0	ug/l	40	EEI 1998. Source is G&M 1994.
GM-62C_6/9/92_NM	GM-62C		6/9/1992	Total PCBs	0	ug/l		EEI 1998. Source is G&M 1994.
GM-65A_6/10/92_NM	GM-65A		6/10/1992	Total PCBs	0	ug/l		EEI 1998. Source is G&M 1994.
GM-66A_6/11/92_NM	GM-66A		6/11/1992	Total PCBs	0	ug/l		EEI 1998. Source is G&M 1994.
GM-66B_6/11/92_NM	GM-66B		6/11/1992	Total PCBs	0	ug/l		EEI 1998. Source is G&M 1994.
GM-66C_6/10/92_DUP	GM-66C		6/10/1992	Total PCBs	0	ug/l		EEI 1998. Source is G&M 1994.
GM-66C_6/10/92_NM	GM-66C		6/10/1992	Total PCBs	0	ug/l		EEI 1998. Source is G&M 1994.
GW-1(T)_12/14/99_NM	GW-1(T)		12/14/1999	Total PCBs	3.98	ug/l		Trench Samples. IEPA , July 31, 2000
GW-2(T)_12/14/99_NM	GW-2(T)		12/14/1999	Total PCBs	358	ug/l		Trench Samples. IEPA , July 31, 2000
GW-3(T)_12/14/99_NM	GW-3(T)		12/14/1999	Total PCBs	370	ug/l		Trench Samples. IEPA , July 31, 2000
GW-4(T)_12/14/99_NM	GW-4(T)		12/14/1999	Total PCBs	8.42	ug/l		Trench Samples. IEPA , July 31, 2000
GW-5(T)_12/14/99_NM	GW-5(T)		12/14/1999	Total PCBs	0	ug/l		Trench Samples. IEPA , July 31, 2000
GW-56_3/26/87_NM	GW-56	DC-GW-56	3/26/1987	Total PCBs	0	ug/l		Need RDL; Source is EEI 1988.
GW-6(T)_12/14/99_NM	GW-6(T)		12/14/1999	Total PCBs	0	ug/l		Trench Samples. IEPA , July 31, 2000
KEARBY_3/28/91_NM	KEARBY	G204	3/28/1991	Total PCBs	0	ug/l		EEI 1998; CERCLA SSIR, AREA 1
KEARBY_3/28/91_NM	KEARBY	G204	3/28/1991	Total PCBs	0	ug/l		EEI 1998; CERCLA SSIR, AREA 1
MCDONALD_3/26/87_NM	MCDONALD		3/26/1987	Total PCBs	0	ug/l		EEI 1998. Source is EEI 1988.
P-1_11/15/87_NM	P-1		11/15/1987	Total PCBs	0	ug/l	36	EEI 1998. Source is G&M 1990.
P-1_3/25/87_NM	P-1	DC-GW-44	3/25/1987	Total PCBs	0	ug/l	40	Source is EEI 1988.
P-1_6/3/92_NM	P-1		6/3/1992	Total PCBs	0	ug/l		EEI 1998. Source is G&M 1994.
P-1_9/15/84_NM	P-1		9/15/1984	Total PCBs	0	ug/l	1.64	EEI 1998. Source is G&M 1990.
P-10_11/15/87_NM	P-10		11/15/1987	Total PCBs	0	ug/l	3600	EEI 1998. Source is G&M 1990.
P-10_6/4/92_NM	P-10		6/4/1992	Total PCBs	0	ug/l		EEI 1998. Source is G&M 1994.
P-10_9/15/84_NM	P-10		9/15/1984	Total PCBs	0	ug/l	0.82	EEI 1998. Source is G&M 1994.
P-11_11/15/87_NM	P-11		11/15/1987	Total PCBs	0	ug/l	37	EEI 1998. Source is G&M 1990.
P-11_3/15/87_NM	P-11		3/15/1987	Total PCBs	0	ug/l	40	EEI 1998. Source is G&M 1990.
P-11_3/25/87_NM	P-11	DC-GW-50	3/25/1987	Total PCBs	0	ug/l		Need RDL; Source is EEI 1988.
P-11_6/4/92_NM	P-11		6/4/1992	Total PCBs	0	ug/l		EEI 1998. Source is G&M 1994.
P-11_9/15/84_NM	P-11		9/15/1984	Total PCBs	0	ug/l	0.82	EEI 1998. Source is G&M 1994.
P-12_11/15/87_NM	P-12		11/15/1987	Total PCBs	0	ug/l	36	EEI 1998. Source is G&M 1990.
P-12_6/4/92_NM	P-12		6/4/1992	Total PCBs	0	ug/l		EEI 1998. Source is G&M 1994.
P-12_9/15/84_NM	P-12		9/15/1984	Total PCBs	0	ug/l	0.82	EEI 1998. Source is G&M 1990.
P-13_11/15/87_NM	P-13		11/15/1987	Total PCBs	0	ug/l	36	EEI 1998. Source is G&M 1990.

SAMP_ID	Well_ID	Lab_ID	Coll_Date	Analyte	Result	Units	SQL	Comment
P-13_6/15/84_DUP	P-13		6/15/1984	Total PCBs	0	ug/l	50	EEI 1998. Source is EEI 1988
P-13_6/15/84_DUP	P-13		6/15/1984	Total PCBs	0	ug/l	10	EEI 1998. Source is EEI 1988
P-13_6/15/84_NM	P-13		6/15/1984	Total PCBs	0	ug/l	50	EEI 1998. Source is EEI 1988
P-14_11/15/87_NM	P-14		11/15/1987	Total PCBs	0	ug/l	36	EEI 1998. Source is G&M 1990.
P-14_6/15/84_NM	P-14		6/15/1984	Total PCBs	0	ug/l	50	EEI 1998. Source is EEI 1988.
P-14_6/5/92_NM	P-14		6/5/1992	Total PCBs	0	ug/l		EEI 1998. Source is G&M 1994.
P-2_11/15/87_NM	P-2		11/15/1987	Total PCBs	0	ug/l	37	EEI 1998. Source is G&M 1990.
P-2_6/15/84_NM	P-2		6/15/1984	Total PCBs	0	ug/l	50	EEI 1998. Source is G&M 1994.
P-2_6/3/92_NM	P-2		6/3/1992	Total PCBs	0	ug/l		EEI 1998. Source is G&M 1994.
P-3_11/15/87_NM	P-3		11/15/1987	Total PCBs	0	ug/l	36	EEI 1998. Source is G&M 1990.
P-3_6/3/92_NM	P-3		6/3/1992	Total PCBs	0	ug/l		EEI 1998. Source is G&M 1994.
P-6_11/15/87_NM	P-6		11/15/1987	Total PCBs	0	ug/l	36	EEI 1998. Source is G&M 1990.
P-6_6/15/84_NM	P-6		6/15/1984	Total PCBs	0	ug/l	50	EEI 1998. Source is G&M 1994.
P-6_6/3/92_NM	P-6		6/3/1992	Total PCBs	0	ug/l		EEI 1998. Source is G&M 1994.
P-7_11/15/87_NM	P-7		11/15/1987	Total PCBs	0	ug/l	37	EEI 1998. Source is G&M 1994.
P-7_3/15/89_NM	P-7		3/15/1989	Total PCBs	0	ug/l	370	EEI 1998. Source is G&M 1994.
P-7_3/25/87_NM	P-7	GW-46	3/25/1987	Total PCBs	0	ug/l	40	EEI 1998. Source is G&M 1994.
P-7_6/15/84_NM	P-7		6/15/1984	Total PCBs	0	ug/l	50	EEI 1998. Source is G&M 1990.
P-7_6/4/92_NM	P-7		6/4/1992	Total PCBs	0	ug/l		EEI 1998. Source is G&M 1994.
P-8_11/15/87_NM	P-8		11/15/1987	Total PCBs	0	ug/l	3600	EEI 1998. Source is G&M 1990.
P-8_3/15/89_NM	P-8		3/15/1989	Total PCBs	0	ug/l	18000	EEI 1998. Source is G&M 1990.
P-8_6/15/84_NM	P-8		6/15/1984	Total PCBs	0	ug/l	50	EEI 1998. Source is G&M 1994.
P-8_6/4/92_NM	P-8		6/4/1992	Total PCBs	0	ug/l		EEI 1998. Source is G&M 1994.
SCHMIDT_3/26/87_NM	SCHMIDT	G202	3/26/1987	Total PCBs	0	ug/l		EEI 1998. Source is EEI 1988.
SCHMIDT_3/27/91_NM	SCHMIDT	G202	3/27/1991	Total PCBs	0	ug/l		EEI 1998; CERCLA SSIR, AREA 1
SETTLES_3/15/91_NM	SETTLES	G201	3/15/1991	Total PCBs	0	ug/l		EEI 1998
SETTLES_3/26/87_NM	SETTLES	G201	3/26/1987	Total PCBs	0	ug/l		EEI 1998. Source is EEI 1988.
SETTLES_3/27/91_NM	SETTLES	G201	3/27/1991	Total PCBs	0	ug/l		EEI 1998; CERCLA SSIR, AREA 1
WRIGHT_3/26/87_NM	WRIGHT		3/26/1987	Total PCBs	0	ug/l		EEI 1998. Source is EEI 1988.
X301_1/5/83_NM	X301		1/5/1983	Total PCBs	0	ug/l		Basement Seepage. Source is CERCLA PA Report

Exhibit 10

PB92963377

United States
Environmental Protection
Agency

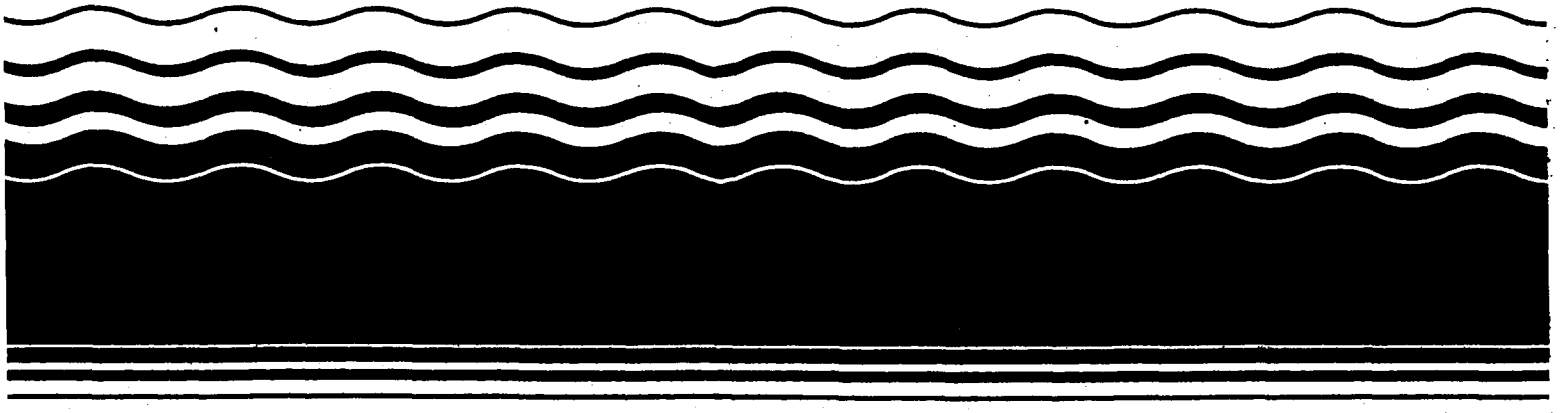
Office of Solid Waste
and Emergency
Response

EPA 540-R-92-026
November 1992

Superfund

EPA

Hazard Ranking System Guidance Manual



2.2 SCORING ALL PATHWAYS AND THREATS

The statutory mandate of the HRS is to assess, to the maximum extent feasible, the relative degree of risk to human health and the environment posed by sites under review. EPA uses the HRS as a screening tool in its site assessment process to identify sites that merit further investigation under Superfund. The site assessment program, however, has limited resources for identifying, evaluating, and scoring large numbers of sites. The competing goals of assessing relative risk to the maximum extent feasible and screening large numbers of sites have caused some confusion over whether to score all pathways and threats at a site when the additional effort will not change the site's listing status. The Agency must balance the need to characterize site risks for all pathways and threats with the constraints imposed by the limited resources available for data collection and analysis.

Generally, all pathways and threats that pose potentially significant risks to human health and the environment should be scored to reflect the importance of that pathway or threat to the overall evaluation of the site. The scorer should use professional judgment to evaluate the potential seriousness of the risk. Criteria to consider when deciding whether a pathway or threat should be scored include:

- Existence of documented releases or contaminated targets
- Potential magnitude of the pathway score
- Availability of scoring data
- Likely range of the overall site score (e.g., near the 28.50 cutoff or not).

In general, score the pathway if there is an observed release, if targets are subject to actual contamination, or if there are major target areas for the pathway.

If the contribution of a pathway or threat to the overall score is minimal, scoring and fully documenting the pathway may not be necessary, even if extensive data are available. As a general guideline, pathways and threats scoring less than 10 points usually do not need to be scored, unless the overall site score is near the cutoff. (Note that near 28.50, the most a 10-point pathway can add to an overall score is approximately half a point. See Section 3.4 for more details.) If a pathway is not scored, the scorer should describe the pathway and available data in the HRS package. This discussion helps present a more thorough and accurate picture of conditions at the site and may be useful later in the remedial process.

If a site score is close to the cutoff, score all pathways even if they add only a few points to the overall site score. In many cases, site scores drop after Quality Assurance review or response to public comments, and the initial inclusion of these additional pathways may keep the site above the cutoff.

In conclusion, the site assessment process should not be viewed simply as an exercise to achieve the maximum HRS score possible by always scoring every pathway, nor as a mechanical process that automatically ends when a score of 28.50 is reached. The scorer must make decisions about whether to score individual pathways or threats based on knowledge of the site, professional judgment and experience, and an understanding how the site score might be affected.

2.3 EVALUATION OF SITES WITH WASTE REMOVALS

A removal action is a relatively short-term response taken to eliminate a threat or prevent more serious environmental problems resulting from the release of CERCLA hazardous substances. Under the original HRS, a site was scored based on conditions that existed prior to a removal action. Under the revised HRS, waste removals (a specific type of removal action in which hazardous substances, or wastes containing hazardous substances, are physically removed from a site) may be considered for scoring purposes under certain circumstances. This section outlines the requirements for evaluating removal actions for HRS purposes, defines a qualifying removal, explains how to determine the cutoff date for qualifying removals, and discusses other relevant scoring issues. The waste removal policy is

Exhibit 11

WELL_ID	DUP_ALIAS	X_COORD	Y_COORD	ZONE	SDATE	ANALYTE	RESULT	UNITS	RDL	DATE_DECIM
ALLEN	G205	746301.07537	4274534.32430		3/15/1991	Chlorobenzene	0.00	ug/l		1991.20
ALLEN	G205	746301.07537	4274534.32430		3/27/1991	Chlorobenzene	0.00	ug/l		1991.23
B-101		745080.70110	4275949.43868	Bedrock	9/15/1984	Chlorobenzene	14400.00	ug/l		1984.71
B-102		745196.50956	4276181.05561	Bedrock	9/15/1984	Chlorobenzene	0.00	ug/l	0.6	1984.71
B-21B		745173.11126	4276152.80893	Intermed	5/10/2000	Chlorobenzene	16000.00	ug/l		2000.35
B-22A		745074.12635	4276207.95439	Shallow	5/10/2000	Chlorobenzene	6100.00	ug/l		2000.35
B-24A		744982.04679	4276040.59847	Shallow	2/15/1986	Chlorobenzene	6180.00	ug/l		1986.12
B-24C		744980.01552	4276040.59847	Intermed	5/11/2000	Chlorobenzene	8800.00	ug/l		2000.36
B-25A		745124.52728	4275996.34543	Shallow	11/15/1985	Chlorobenzene	18900.00	ug/l		1985.87
B-25B		745124.41292	4275996.35502	Intermed	5/10/2000	Chlorobenzene	16000.00	ug/l		2000.35
B-26A		744907.17646	4275882.96555	Shallow	5/11/2000	Chlorobenzene	2800.00	ug/l		2000.36
B-26B		744906.98840	4275882.62611	Intermed	5/11/2000	Chlorobenzene	5900.00	ug/l		2000.36
B-27B		744873.47345	4275651.30775	Shallow	9/15/1984	Chlorobenzene	5320.00	ug/l		1984.71
B-28A		744847.70986	4275747.81555	Shallow	2/15/1986	Chlorobenzene	1510.00	ug/l		1986.12
B-28A	GW-45	744847.70986	4275747.81555	Shallow	3/25/1987	Chlorobenzene	990.00	ug/l		1987.23
B-28B		744847.59945	4275747.51624	Intermed	5/10/2000	Chlorobenzene	2800.00	ug/l		2000.35
B-29A		744978.01953	4275689.67387	Shallow	5/10/2000	Chlorobenzene	2400.00	ug/l		2000.35
B-29B		744977.85854	4275689.61622	Intermed	11/15/1985	Chlorobenzene	1710.00	ug/l		1985.87
B-29B		744977.85854	4275689.61622	Intermed	5/10/2000	Chlorobenzene	1600.00	ug/l		2000.35
B-29B		744977.85854	4275689.61622	Intermed	11/15/1984	Chlorobenzene	1500.00	ug/l		1984.87
B-30B		745059.90313	4275825.15815	Intermed	9/15/1984	Chlorobenzene	2350.00	ug/l		1984.71
B-31B		745279.07849	4276118.56541	Shallow	11/15/1985	Chlorobenzene	0.00	ug/l	6	1985.87
B-31C		745279.07849	4276118.56541	Intermed	2/15/1986	Chlorobenzene	483.00	ug/l		1986.12
B-31C		745279.07849	4276118.56541	Intermed	11/15/1985	Chlorobenzene	104.00	ug/l		1985.87
BALLET	G203	746485.21356	4274382.70925		3/27/1991	Chlorobenzene	0.00	ug/l		1991.23
CA-1		746882.47248	4275761.64442	Shallow	2/2/2000	Chlorobenzene	2400.00	ug/l		2000.09
CA-2		746897.90598	4275755.67680	Shallow	2/2/2000	Chlorobenzene	610.00	ug/l		2000.09
CA-3		746913.13370	4275753.41322	Shallow	2/2/2000	Chlorobenzene	550.00	ug/l		2000.09
CA-3	DUP-3	746913.13370	4275753.41322	Shallow	2/2/2000	Chlorobenzene	430.00	ug/l		2000.09
CA-4		746880.62046	4275749.50340	Shallow	2/2/2000	Chlorobenzene	2100.00	ug/l		2000.09
DW-34		746036.46708	4275670.26270	Shallow	1/26/2000	Chlorobenzene	0.00	ug/l	25000	2000.07
DW-35		745261.57597	4275275.94374		2/15/1985	Chlorobenzene	0.00	ug/l		1985.12
DW-36		745176.56369	4275153.42604		2/15/1985	Chlorobenzene	0.00	ug/l		1985.12
DW-A		745560.36911	4276035.74095		11/15/1985	Chlorobenzene	1100.00	ug/l		1985.87
EE-01	DC-GW-10	746376.26844	4275024.12555	Shallow	3/17/1987	Chlorobenzene	1600.00	ug/l		1987.21
EE-02	DC-GW-11	746419.49351	4274956.34750	Shallow	3/17/1987	Chlorobenzene	11000.00	ug/l		1987.21
EE-03	DC-GW-12	746466.93298	4274899.57199	Shallow	3/17/1987	Chlorobenzene	11.00	ug/l		1987.21
EE-04	DC-GW-13	746562.20442	4274954.82909	Shallow	3/17/1987	Chlorobenzene	0.00	ug/l		1987.21
EE-05	DC-GW-21	746095.06102	4274966.83528	Shallow	3/18/1987	Chlorobenzene	1.00	ug/l		1987.21
EE-06	GW-01	744632.24719	4275122.61764	Shallow	3/16/1987	Chlorobenzene	14.00	ug/l		1987.20
EE-07	GW-02	744489.79591	4274964.49746	Shallow	3/16/1987	Chlorobenzene	1.00	ug/l		1987.20
EE-08	GW-06	744584.27108	4275310.32402	Shallow	3/16/1987	Chlorobenzene	7.00	ug/l		1987.20
EE-09	GW-03	744080.97434	4274159.24683	Shallow	3/16/1987	Chlorobenzene	33.00	ug/l		1987.20
EE-10	GW-04	744661.39882	4275002.88892	Shallow	3/16/1987	Chlorobenzene	380.00	ug/l		1987.20
EE-11	DC-GW-32	746187.24397	4275008.78640	Shallow	3/24/1987	Chlorobenzene	2500.00	ug/l		1987.22
EE-12	DC-GW-29	746437.25834	4275091.65913	Shallow	3/23/1987	Chlorobenzene	390.00	ug/l		1987.22
EE-12	DC-GW-24	746437.25834	4275091.65913	Shallow	3/23/1987	Chlorobenzene	270.00	ug/l		1987.22
EE-13	DC-GW-23	746534.10433	4275429.59118	Shallow	3/23/1987	Chlorobenzene	0.00	ug/l		1987.22
EE-14	DC-GW-26	746444.16871	4275255.98257	Shallow	3/23/1987	Chlorobenzene	3100.00	ug/l		1987.22
EE-15	DC-GW-27	746450.30093	4275402.72940	Shallow	3/23/1987	Chlorobenzene	120.00	ug/l		1987.22
EE-16	DC-GW-28	746406.06531	4275176.32057	Shallow	3/23/1987	Chlorobenzene	550.00	ug/l		1987.22
EE-17	GW-05	745346.52482	4276099.64655	Shallow	3/16/1987	Chlorobenzene	29.00	ug/l		1987.20

WELL_ID	DUP_ALIAS	X_COORD	Y_COORD	ZONE	SDATE	ANALYTE	RESULT	UNITS	RDL	DATE_DECIM
EE-18	GW-09	745185.30599	4276062.04494	Shallow	3/16/1987	Chlorobenzene	6700.00	ug/l		1987.20
EE-19	GW-07	745080.18080	4275784.41025	Shallow	3/16/1987	Chlorobenzene	1500.00	ug/l		1987.20
EE-20	DC-GW-31	746597.42025	4275474.42355	Shallow	3/23/1987	Chlorobenzene	0.00	ug/l		1987.22
EE-21	GW-38	745714.32922	4275901.20237	Shallow	3/24/1987	Chlorobenzene	0.00	ug/l	6	1987.22
EE-22	GW-39A	745406.67168	4275691.03478	Shallow	7/14/1987	Chlorobenzene	151000.00	ug/l		1987.53
EE-23	GW-40	745472.42448	4275348.31699	Shallow	3/24/1987	Chlorobenzene	0.00	ug/l	6	1987.22
EE-24		745581.03344	4275751.30231	Shallow	5/9/2000	Chlorobenzene	12.00	ug/l		2000.35
EE-24	GW-41	745581.03344	4275751.30231	Shallow	3/24/1987	Chlorobenzene	0.00	ug/l	6	1987.22
EE-24	GW-41A	745581.03344	4275751.30231	Shallow	7/14/1987	Chlorobenzene	0.00	ug/l	6	1987.53
EE-25	GW-43	745259.49645	4275427.37740	Shallow	3/24/1987	Chlorobenzene	0.00	ug/l	6	1987.22
G101		746135.47416	4274925.70797	Shallow	10/23/1980	Chlorobenzene	0.00	ug/l		1980.81
G101(99)		744978.90714	4276184.12105	Shallow	5/24/1999	Chlorobenzene	130000.00	ug/l		1999.39
G101(K)		747162.73821	4276025.14141	Shallow	5/10/1999	Chlorobenzene	0.00	ug/l		1999.35
G102		746261.92116	4274909.92566	Shallow	10/23/1980	Chlorobenzene	1200.00	ug/l		1980.81
G102(99)		744864.86101	4275922.48580	Shallow	5/24/1999	Chlorobenzene	260.00	ug/l		1999.39
G102(K)		746966.70301	4275812.76995	Shallow	5/10/1999	Chlorobenzene	1600.00	ug/l		1999.35
G103	DC-GW-15	746242.29807	4274764.55406	Shallow	3/17/1987	Chlorobenzene	5.00	ug/l		1987.21
G103(99)		744750.81488	4275748.06231	Shallow	5/24/1999	Chlorobenzene	0.00	ug/l		1999.39
G103(K)		746716.21359	4275714.75235	Shallow	5/10/1999	Chlorobenzene	14.00	ug/l		1999.35
G104	DC-GW-16	746130.89592	4274794.33220	Shallow	3/17/1987	Chlorobenzene	5.00	ug/l		1987.21
G104(99)		745206.99941	4276049.94913	Shallow	5/26/1999	Chlorobenzene	14000.00	ug/l		1999.40
G104(K)		746574.63261	4275880.83773	Shallow	5/11/1999	Chlorobenzene	2500.00	ug/l		1999.36
G105		746207.69192	4274645.29727		10/23/1980	Chlorobenzene	0.00	ug/l		1980.81
G105(K)		746460.27875	4275635.79373	Shallow	5/11/1999	Chlorobenzene	5.00	ug/l		1999.36
G106	DC-GW-33	746295.82460	4275027.93431	Shallow	3/24/1987	Chlorobenzene	1200.00	ug/l		1987.22
G106(99)		744401.96789	4275184.54025	Shallow	5/27/1999	Chlorobenzene	0.00	ug/l		1999.40
G106(K)		746375.87470	4275790.98826	Shallow	5/11/1999	Chlorobenzene	2300.00	ug/l		1999.36
G106(K)	G116(K)	746375.87470	4275790.98826	Shallow	5/11/1999	Chlorobenzene	1800.00	ug/l		1999.36
G107	DC-GW-19	746224.27468	4274952.17739	Shallow	3/18/1987	Chlorobenzene	3100.00	ug/l		1987.21
G107(99)		744173.87563	4274909.48781	Shallow	5/27/1999	Chlorobenzene	0.00	ug/l		1999.40
G107(K)		746245.18457	4275957.07364	Shallow	5/12/1999	Chlorobenzene	80.00	ug/l		1999.36
G108	DC-GW-18	746502.52164	4274768.01485	Shallow	3/18/1987	Chlorobenzene	1.00	ug/l		1987.21
G108(99)		743905.53179	4274151.41647	Shallow	5/25/1999	Chlorobenzene	0.00	ug/l		1999.39
G108(K)		746242.46186	4275758.31573	Shallow	5/11/1999	Chlorobenzene	9.00	ug/l		1999.36
G109		746290.40553	4274817.58579	Shallow	10/23/1980	Chlorobenzene	19.00	ug/l		1980.81
G109(99)		745750.39568	4276942.19239	Shallow	5/27/1999	Chlorobenzene	0.00	ug/l		1999.40
G109(K)		746234.29373	4275627.62560	Shallow	5/12/1999	Chlorobenzene	590.00	ug/l		1999.36
G110	DC-GW-36	746319.79080	4274962.38620	Shallow	3/24/1987	Chlorobenzene	6.00	ug/l		1987.22
G110(99)		745837.60743	4276479.29927	Shallow	5/26/1999	Chlorobenzene	0.00	ug/l		1999.40
G110(K)		746081.82191	4275543.22155	Shallow	5/13/1999	Chlorobenzene	400.00	ug/l		1999.36
G111		746277.85595	4274696.35499		10/23/1980	Chlorobenzene	0.00	ug/l		1980.81
G111(99)		745555.93409	4275709.56461	Shallow	5/24/1999	Chlorobenzene	32.00	ug/l		1999.39
G111(K)		746569.18719	4276117.71359	Shallow	5/12/1999	Chlorobenzene	2.00	ug/l		1999.36
G112		746260.16192	4275055.51119	Shallow	10/23/1980	Chlorobenzene	100.00	ug/l		1980.81
G112(99)		745526.03041	4275426.83895	Shallow	5/25/1999	Chlorobenzene	18.00	ug/l		1999.39
G112(K)		746266.96626	4276180.33595	Shallow	5/13/1999	Chlorobenzene	8.00	ug/l		1999.36
G113(99)		745197.08998	4275464.89817	Shallow	5/25/1999	Chlorobenzene	8.00	ug/l		1999.39
G113(K)		745627.12916	4275227.38707	Shallow	5/13/1999	Chlorobenzene	0.00	ug/l		1999.36
G114(99)		745150.87520	4275290.91315	Shallow	5/25/1999	Chlorobenzene	0.00	ug/l		1999.39
G114(K)		746038.25853	4275758.31573	Shallow	5/12/1999	Chlorobenzene	110000.00	ug/l		1999.36
G115(K)		746079.09920	4276008.80515	Shallow	5/12/1999	Chlorobenzene	3.00	ug/l		1999.36
G116(99)		744647.94974	4275152.26883	Shallow	5/26/1999	Chlorobenzene	73.00	ug/l		1999.40

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G117(99)		744332.60189	4274681.96556	Shallow	5/27/1999	Chlorobenzene	0.00	ug/l		1999.40
GM-1		747195.30284	4276014.91888	Shallow	11/15/1983	Chlorobenzene	0.00	ug/l	1	1983.87
GM-106		744935.19816	4276120.18193	Bedrock	6/8/1992	Chlorobenzene	2000.00	ug/l		1992.43
GM-10A		746608.85838	4276108.71938	Shallow	11/15/1983	Chlorobenzene	0.00	ug/l	1	1983.87
GM-10B		746608.85838	4276108.71938	Intermed	2/2/2000	Chlorobenzene	2200.00	ug/l		2000.09
GM-10C		746608.85838	4276108.71938	Deep	2/2/2000	Chlorobenzene	2500.00	ug/l		2000.09
GM-11		746931.38581	4276276.59933	Shallow	11/15/1983	Chlorobenzene	0.00	ug/l	1	1983.87
GM-12A		746951.51508	4275784.55063	Shallow	11/15/1984	Chlorobenzene	565.00	ug/l		1984.87
GM-12B		746951.51508	4275784.55063	Intermed	9/15/1984	Chlorobenzene	0.00	ug/l	60	1984.71
GM-12C		746951.51508	4275784.55063	Deep	2/2/2000	Chlorobenzene	150.00	ug/l		2000.09
GM-13		746611.55415	4275666.01162	Shallow	2/15/1986	Chlorobenzene	18600.00	ug/l		1986.12
GM-14		746557.87611	4275887.43354	Shallow	2/3/2000	Chlorobenzene	350000.00	ug/l		2000.09
GM-15		746794.85864	4275966.95167	Shallow	2/2/2000	Chlorobenzene	130.00	ug/l		2000.09
GM-16A		746721.14682	4276334.75054	Shallow	9/15/1984	Chlorobenzene	0.00	ug/l	0.6	1984.71
GM-16B		746721.14682	4276334.75054	Intermed	9/15/1984	Chlorobenzene	2.00	ug/l		1984.71
GM-17A		746066.99892	4275780.32047	Shallow	11/15/1987	Chlorobenzene	234000.00	ug/l		1987.87
GM-17B		746066.96699	4275780.30705	Intermed	11/15/1984	Chlorobenzene	17600.00	ug/l		1984.87
GM-17C		746066.96699	4275780.30705	Deep	11/15/1987	Chlorobenzene	21400.00	ug/l		1987.87
GM-18A		745687.16024	4275410.65069	Shallow	1/28/2000	Chlorobenzene	130.00	ug/l		2000.07
GM-18B		745687.16024	4275410.65069	Intermed	1/28/2000	Chlorobenzene	440.00	ug/l		2000.07
GM-19A		745383.55906	4275621.99152	Shallow	5/15/1987	Chlorobenzene	35.60	ug/l		1987.37
GM-19B		745383.55906	4275621.99152	Intermed	12/15/1986	Chlorobenzene	10.30	ug/l		1986.95
GM-19C		745383.55906	4275621.99152	Deep	2/15/1985	Chlorobenzene	102.00	ug/l		1985.12
GM-2		746026.75000	4275433.30000	Shallow	2/3/2000	Chlorobenzene	37.00	ug/l		2000.09
GM-20A		745566.63461	4275819.98840	Shallow	11/15/1985	Chlorobenzene	50.30	ug/l		1985.87
GM-20B		745566.66738	4275820.17953	Intermed	5/9/2000	Chlorobenzene	910.00	ug/l		2000.35
GM-21A		745505.46336	4275952.87355	Shallow	2/15/1986	Chlorobenzene	123.00	ug/l		1986.12
GM-21B		745502.33791	4275952.87355	Intermed	5/15/1985	Chlorobenzene	1862.10	ug/l		1985.37
GM-22A		745453.38131	4275757.51107	Shallow	5/15/1987	Chlorobenzene	8110.00	ug/l		1987.37
GM-22B		745453.38131	4275757.51107	Intermed	2/15/1985	Chlorobenzene	41.50	ug/l		1985.12
GM-23		745290.03515	4275407.03504	Shallow	9/15/1984	Chlorobenzene	0.00	ug/l		1984.71
GM-24A		745051.54564	4274975.90041	Shallow	9/15/1984	Chlorobenzene	0.00	ug/l		1984.71
GM-24B		745051.54564	4274975.90041	Intermed	9/15/1984	Chlorobenzene	18.00	ug/l		1984.71
GM-25A		744606.48137	4274750.86792	Shallow	9/15/1984	Chlorobenzene	14.00	ug/l		1984.71
GM-25B		744606.48137	4274750.86792	Intermed	9/15/1984	Chlorobenzene	0.00	ug/l	0.6	1984.71
GM-26A		745657.25810	4276329.53337	Shallow	9/15/1984	Chlorobenzene	0.00	ug/l		1984.71
GM-26B		745657.25810	4276329.53337	Intermed	9/15/1984	Chlorobenzene	0.00	ug/l		1984.71
GM-27B		745008.72167	4276264.30931	Intermed	11/15/1987	Chlorobenzene	60200.00	ug/l		1987.87
GM-27C		745008.61689	4276264.09976	Deep	6/9/1992	Chlorobenzene	3400.00	ug/l		1992.44
GM-28B		744822.35914	4275803.93575	Intermed	2/15/1986	Chlorobenzene	6130.00	ug/l		1986.12
GM-28C		744823.33533	4275807.50317	Deep	11/15/1985	Chlorobenzene	5130.00	ug/l		1985.87
GM-29		746497.48832	4275793.49697	Shallow	9/15/1984	Chlorobenzene	0.00	ug/l	0.6	1984.71
GM-3		745980.07697	4276175.80978	Shallow	11/15/1983	Chlorobenzene	0.00	ug/l	20	1983.87
GM-30		746750.22243	4275719.68966	Shallow	2/15/1986	Chlorobenzene	7.14	ug/l		1986.12
GM-31A		745675.02050	4275292.57249	Shallow	11/15/1987	Chlorobenzene	26.00	ug/l		1987.87
GM-31B		745675.02050	4275292.57249	Intermed	11/15/1989	Chlorobenzene	387.00	ug/l		1989.87
GM-31C		745675.02050	4275292.57249	Deep	1/28/2000	Chlorobenzene	2000.00	ug/l		2000.07
GM-32		746141.87130	4275583.12190	Shallow	2/2/2000	Chlorobenzene	26000.00	ug/l		2000.09
GM-33		746074.77375	4275632.46285	Shallow	2/1/2000	Chlorobenzene	0.00	ug/l	50000	2000.08
GM-34		746072.03542	4275593.80308	Shallow	2/1/2000	Chlorobenzene	0.00	ug/l	50000	2000.08
GM-35		746068.06400	4275556.41896	Shallow	2/1/2000	Chlorobenzene	0.00	ug/l	250	2000.08
GM-36		746101.61277	4275724.16283	Shallow	2/1/2000	Chlorobenzene	0.00	ug/l	10000	2000.08

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GM-37		746130.96053	4275825.17483	Shallow	2/1/2000	Chlorobenzene	0.00	ug/l	5	2000.08
GM-38		746058.88806	4275726.62901	Shallow	1/25/2000	Chlorobenzene	1800.00	ug/l		2000.06
GM-4A		746118.04277	4276010.40316	Shallow	1/26/2000	Chlorobenzene	200.00	ug/l		2000.07
GM-4A		746118.04277	4276010.40316	Shallow	11/15/1988	Chlorobenzene	0.00	ug/l	6	1988.87
GM-4B		746118.04277	4276010.40316	Intermed	11/15/1984	Chlorobenzene	15900.00	ug/l		1984.87
GM-4C		746118.04277	4276010.40316	Deep	11/15/1989	Chlorobenzene	14700.00	ug/l		1989.87
GM-5		745876.14022	4275843.64069	Shallow	11/15/1983	Chlorobenzene	0.00	ug/l	1	1983.04
GM-54A		745572.31971	4275307.43364	Shallow	2/1/2000	Chlorobenzene	71.00	ug/l		2000.08
GM-54B		745572.31971	4275307.43364	Intermed	11/15/1987	Chlorobenzene	83.00	ug/l		1987.87
GM-55C		744779.30215	4275744.54679	Deep	11/15/1987	Chlorobenzene	4030.00	ug/l		1987.87
GM-56C		744891.59702	4276020.12200	Deep	11/15/1990	Chlorobenzene	4620.00	ug/l		1990.87
GM-57C		744955.98429	4276155.81530	Deep	3/15/1989	Chlorobenzene	7380.00	ug/l		1989.20
GM-58A		744895.11061	4276010.31236	Shallow	11/15/1987	Chlorobenzene	0.00	ug/l	6	1987.87
GM-59A		745625.71720	4275289.63448	Shallow	1/31/2000	Chlorobenzene	20.00	ug/l		2000.08
GM-60A		745480.58557	4276042.67592	Shallow	5/8/2000	Chlorobenzene	490.00	ug/l		2000.35
GM-60B		745480.58557	4276042.67592	Intermed	5/9/2000	Chlorobenzene	850.00	ug/l	10	2000.35
GM-62A		745169.33666	4275731.87415	Shallow	8/15/1988	Chlorobenzene	0.00	ug/l	6	1988.62
GM-62B		745169.33666	4275731.87415	Intermed	8/15/1988	Chlorobenzene	43.00	ug/l		1988.62
GM-62C		745168.33666	4275731.87415	Deep	6/9/1992	Chlorobenzene	130.00	ug/l		1992.44
GM-65A		744851.34645	4275625.35672	Shallow	6/10/1992	Chlorobenzene	0.00	ug/l		1992.44
GM-66A		744747.62381	4275682.63639	Shallow	6/11/1992	Chlorobenzene	0.00	ug/l		1992.44
GM-66B		744747.62381	4275682.63639	Intermed	6/11/1992	Chlorobenzene	54.00	ug/l		1992.44
GM-66C		744747.62381	4275682.63639	Deep	6/10/1992	Chlorobenzene	0.00	ug/l		1992.44
GM-6A		746018.36917	4275585.93917	Shallow	1/26/2000	Chlorobenzene	56000.00	ug/l		2000.07
GM-6B		746018.36917	4275585.93917	Intermed	1/26/2000	Chlorobenzene	41000.00	ug/l		2000.07
GM-7		745775.65124	4275540.62125	Shallow	11/15/1983	Chlorobenzene	0.00	ug/l	1	1983.87
GM-8		745739.81748	4275290.78749	Shallow	11/15/1983	Chlorobenzene	0.00	ug/l	1	1983.87
GM-9A		746438.27583	4275635.47667	Shallow	11/15/1983	Chlorobenzene	1270.00	ug/l		1983.87
GM-9B		746438.27583	4275635.47667	Intermed	5/15/1985	Chlorobenzene	1780.50	ug/l		1985.37
GM-9C		746438.27583	4275635.47667	Deep	5/15/1987	Chlorobenzene	636.00	ug/l		1987.37
GP-10A		746144.63121	4275882.48347	Shallow	1/28/2000	Chlorobenzene	0.00	ug/l	5	2000.07
GP-10B		746144.63121	4275882.48347	Intermed	1/28/2000	Chlorobenzene	200.00	ug/l	5	2000.07
GP-11A		746119.98622	4275772.95017	Shallow	1/28/2000	Chlorobenzene	2300.00	ug/l		2000.07
GP-11B		746118.61705	4275772.95017	Intermed	1/28/2000	Chlorobenzene	6400.00	ug/l		2000.07
GP-12A		746196.65953	4275499.11692	Shallow	1/31/2000	Chlorobenzene	40000.00	ug/l		2000.08
GP-12B		746195.29036	4275499.11692	Intermed	1/31/2000	Chlorobenzene	1200.00	ug/l		2000.08
GP-13A		746334.94532	4275588.11272	Shallow	1/31/2000	Chlorobenzene	220.00	ug/l		2000.08
GP-13B		746333.57616	4275588.11272	Intermed	1/31/2000	Chlorobenzene	110.00	ug/l		2000.08
GP-14A		746452.69362	4275731.87518	Shallow	2/1/2000	Chlorobenzene	2500.00	ug/l		2000.08
GP-14B		746451.32446	4275731.87518	Intermed	2/1/2000	Chlorobenzene	510.00	ug/l		2000.08
GP-15A		746485.55361	4275933.14262	Shallow	2/1/2000	Chlorobenzene	7300.00	ug/l		2000.08
GP-15B		746484.18445	4275933.14262	Intermed	2/1/2000	Chlorobenzene	36000.00	ug/l		2000.08
GP-16A		746419.83363	4276079.64341	Shallow	2/1/2000	Chlorobenzene	33.00	ug/l		2000.08
GP-16B		746418.46447	4276079.64341	Intermed	2/1/2000	Chlorobenzene	180.00	ug/l		2000.08
GP-17A		746867.55100	4275753.78184	Shallow	2/2/2000	Chlorobenzene	0.00	ug/l	5	2000.09
GP-17B		746866.18183	4275753.78184	Intermed	2/2/2000	Chlorobenzene	0.00	ug/l	500	2000.09
GP-18A		746744.32604	4275725.02935	Shallow	2/3/2000	Chlorobenzene	22.00	ug/l		2000.09
GP-18B		746741.58770	4275725.02935	Intermed	2/3/2000	Chlorobenzene	0.00	ug/l	200	2000.09
GP-19A		746634.79273	4275755.15101	Shallow	2/3/2000	Chlorobenzene	0.00	ug/l	2500	2000.09
GP-19B		746633.42357	4275753.78184	Intermed	2/3/2000	Chlorobenzene	12000.00	ug/l		2000.09
GP-1A		745903.65795	4275603.17355	Shallow	1/26/2000	Chlorobenzene	140.00	ug/l		2000.07
GP-1B		745902.28878	4275603.17355	Intermed	1/25/2000	Chlorobenzene	18000.00	ug/l		2000.06

WELL_ID	DUP_ALIAS	X_COORD	Y_COORD	ZONE	SDATE	ANALYTE	RESULT	UNITS	RDL	DATE_DECIM
GP-20A		746599.19441	4275952.31095	Shallow	2/3/2000	Chlorobenzene	26000.00	ug/l		2000.09
GP-20B		746597.82525	4275952.31095	Intermed	2/3/2000	Chlorobenzene	1900.00	ug/l		2000.09
GP-2A		745970.74710	4275800.33349	Shallow	1/26/2000	Chlorobenzene	1700.00	ug/l		2000.07
GP-2B		745969.37793	4275800.33349	Intermed	1/25/2000	Chlorobenzene	17000.00	ug/l		2000.06
GP-3A		746009.08375	4276038.56842	Shallow	1/26/2000	Chlorobenzene	0.00	ug/l	5	2000.07
GP-3B		746007.71459	4276038.56842	Intermed	1/26/2000	Chlorobenzene	170000.00	ug/l		2000.07
GP-4A		746099.44873	4275889.32930	Shallow	1/26/2000	Chlorobenzene	220000.00	ug/l		2000.07
GP-4B		746098.07956	4275889.32930	Intermed	1/26/2000	Chlorobenzene	290000.00	ug/l		2000.07
GP-5A		746093.97206	4275840.03931	Shallow	1/26/2000	Chlorobenzene	390.00	ug/l		2000.07
GP-6A		745761.26466	4275764.73517	Shallow	1/26/2000	Chlorobenzene	11.00	ug/l		2000.07
GP-6A		745761.26466	4275764.73517	Shallow	1/26/2000	Chlorobenzene	10.00	ug/l		2000.07
GP-6B		745761.26466	4275764.73517	Intermed	1/27/2000	Chlorobenzene	570.00	ug/l		2000.07
GP-7A		745825.16276	4275992.37010	Shallow	1/27/2000	Chlorobenzene	0.00	ug/l	5	2000.07
GP-7B		745825.61547	4275992.01677	Intermed	1/27/2000	Chlorobenzene	150.00	ug/l		2000.07
GP-8A		745922.41774	4276169.63297	Shallow	1/27/2000	Chlorobenzene	0.00	ug/l	5	2000.07
GP-8B		745921.45711	4276170.00838	Intermed	1/27/2000	Chlorobenzene	8900.00	ug/l	5	2000.07
GP-9A		746210.35119	4276027.61509	Shallow	1/28/2000	Chlorobenzene	5300.00	ug/l		2000.07
GP-9B		746208.98203	4276027.61509	Intermed	1/28/2000	Chlorobenzene	2600.00	ug/l		2000.07
GW-1(T)		744185.10467	4274107.21735	Shallow	12/14/1999	Chlorobenzene	0.00	ug/l		1999.95
GW-2(T)		744137.33692	4274214.48529	Shallow	12/14/1999	Chlorobenzene	0.00	ug/l		1999.95
GW-3(T)		744108.84387	4274145.76676	Shallow	12/14/1999	Chlorobenzene	0.00	ug/l		1999.95
GW-4(T)		743948.77999	4274113.08356	Shallow	12/14/1999	Chlorobenzene	0.00	ug/l		1999.95
GW-5(T)		744009.11821	4274179.28799	Shallow	12/14/1999	Chlorobenzene	0.00	ug/l		1999.95
GW-56	CLAYTON	745469.73102	4275863.84113		3/26/1987	Chlorobenzene	120.00	ug/l		1987.23
GW-6(T)		743888.44178	4274103.86522	Shallow	12/14/1999	Chlorobenzene	0.00	ug/l		1999.95
KEARBY	G204	745180.55363	4272612.97877		3/15/1991	Chlorobenzene	0.00	ug/l		1991.20
MCDONALD	DC-GW-55	746239.69788	4274433.77031		3/26/1987	Chlorobenzene	0.00	ug/l		1987.23
MW-3B		745910.50378	4276061.84425	Intermed	1/27/2000	Chlorobenzene	5500.00	ug/l		2000.07
MW-3C		745909.13462	4276060.47508	Deep	1/27/2000	Chlorobenzene	9500.00	ug/l		2000.07
MW-5B		745866.69046	4275819.50182	Intermed	1/28/2000	Chlorobenzene	19000.00	ug/l		2000.07
MW-5C		745866.69046	4275818.13265	Deep	1/28/2000	Chlorobenzene	990.00	ug/l		2000.07
MW-7B		745785.90965	4275612.75772	Intermed	1/25/2000	Chlorobenzene	61.00	ug/l		2000.06
MW-7C		745785.90965	4275612.75772	Deep	1/25/2000	Chlorobenzene	7800.00	ug/l		2000.06
P-1		744787.65010	4275740.58946	Intermed	6/3/1992	Chlorobenzene	1800.00	ug/l		1992.42
P-10		744935.29925	4276094.91475	Intermed	6/4/1992	Chlorobenzene	8600.00	ug/l		1992.42
P-11		744948.42134	4276131.49535	Intermed	6/4/1992	Chlorobenzene	7000.00	ug/l		1992.42
P-12		744965.57970	4276186.99569	Intermed	11/15/1987	Chlorobenzene	37400.00	ug/l		1987.87
P-13		745000.61574	4276252.03606	Intermed	11/15/1991	Chlorobenzene	6400.00	ug/l		1991.87
P-14		744994.09931	4276244.88012	Shallow	5/15/1987	Chlorobenzene	158000.00	ug/l		1987.37
P-2		744819.50723	4275785.39802	Intermed	6/3/1992	Chlorobenzene	3900.00	ug/l		1992.42
P-3		744849.33068	4275831.30994	Intermed	6/3/1992	Chlorobenzene	420.00	ug/l		1992.42
P-6		744864.31180	4275902.89181	Shallow	11/15/1989	Chlorobenzene	1000.00	ug/l		1989.87
P-7		744912.03429	4276030.87343	Shallow	5/15/1987	Chlorobenzene	25200.00	ug/l		1987.37
P-8		744902.58647	4276025.64443	Intermed	11/15/1990	Chlorobenzene	5280.00	ug/l		1990.87
SCHMIDT	DC-GW-54	746192.82438	4274413.99143		3/26/1987	Chlorobenzene	0.00	ug/l		1987.23
SETTLES	DC-GW-53	746181.85352	4274425.77804		3/26/1987	Chlorobenzene	0.00	ug/l		1987.23
WRIGHT	DC-GW-52	746168.61618	4274436.10591		3/26/1987	Chlorobenzene	0.00	ug/l		1987.23

Exhibit 12

Varigram Analysis

Variogram analysis is a spatial statistical (e.g., geostatistical) technique that is used to assess and model spatial correlations exhibited by groundwater data along specific directions. Environmental field data usually display a wide range of variability at a site. Such erratic variations have led many to use classical (i.e., non-spatial) statistical estimation methods. These methods assume that the collected data to be unbiased, unclustered, and independent (i.e., devoid of any correlational structures). In practice, however, field environmental data are collected in a biased fashion, are clustered around critical locations, and are expected to display a degree of spatial structure. Geostatistical techniques, including the variogram analysis, recognize these properties and, according to well-defined criteria, provide the statistical tools for analysis of spatial data. These analyses are usually initiated by a variogram analysis in order to model correlations along different directions.

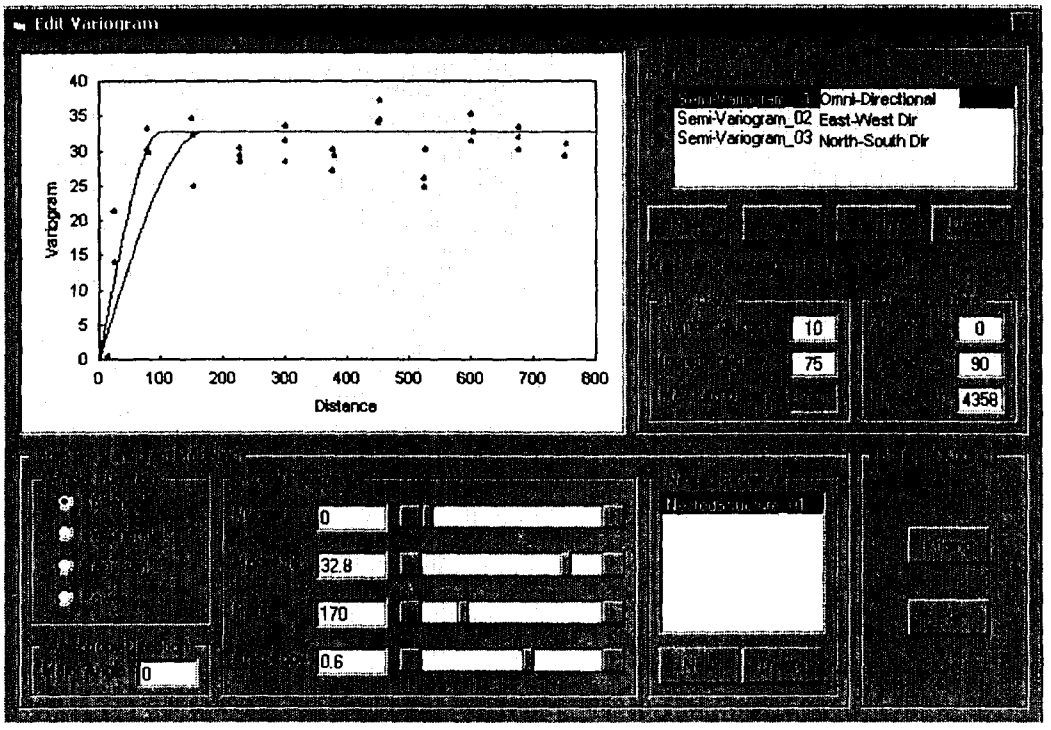
In many sites, groundwater data exhibit spatial correlations along flow direction that are distinctly different from those along the direction perpendicular to the flow. The variogram analysis can assist the user to quantify and distinguish these differences. For example, at Sauget, the variogram along the north-south direction was distinctly different the variogram along the east-west direction. Specifically, along the east-west direction, the variogram indicates spatial continuity (correlation) among observed concentrations, while along north-south the data appear to be devoid of such continuity.

The United States Environmental Protection Agency (U.S. EPA) has taken the lead in promotion of geostatistics by producing the first public-domain software package, known as GEO-EAS (Geostatistical Environment Assessment Software) developed by Englund and Sparks (EPA/600/4-88/033a, 1988). This package was followed by another EPA package, known as GEOPACK, developed by Yates and Yates (EPA/600/8-90/004, 1990). EPA also led the field of environmental application by conducting an extensive variogram analysis of lead data in 1988. The successful results of application of geostatistics prompted the U.S. EPA to recommend its use in spatial environmental data analysis, as stated "Guidance for Data Usability in Risk Assessment" (EPA/540/G-90/008, 1990) and "Basics of Pump-and-Treat Ground-Water Remediation Technology" (EPA/600/8-90/003, 1990). Furthermore, with the support of EPA, American Society of Testing and Material (ASTM) generated the series of standard guides for application of geostatistical techniques in environmental site investigation, including ASTM Standard Guide (D 5549-94) for application of variogram analysis in environmental site investigations.

Exhibit 13

Sauget Groundwater Chlorobenzene Variography

Shallow Groundwater Variography
Using Maximum Concentration Detected



Deep/Intermediate Groundwater Variography
Using Maximum Concentration Detected

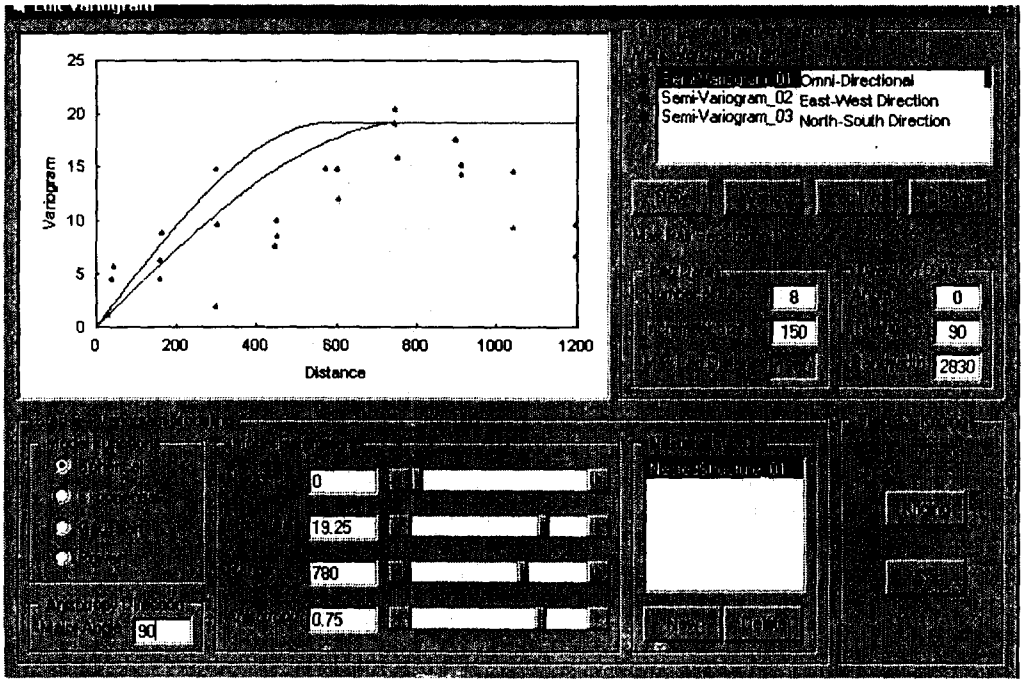


Exhibit 14

PB92963377

United States
Environmental Protection
Agency

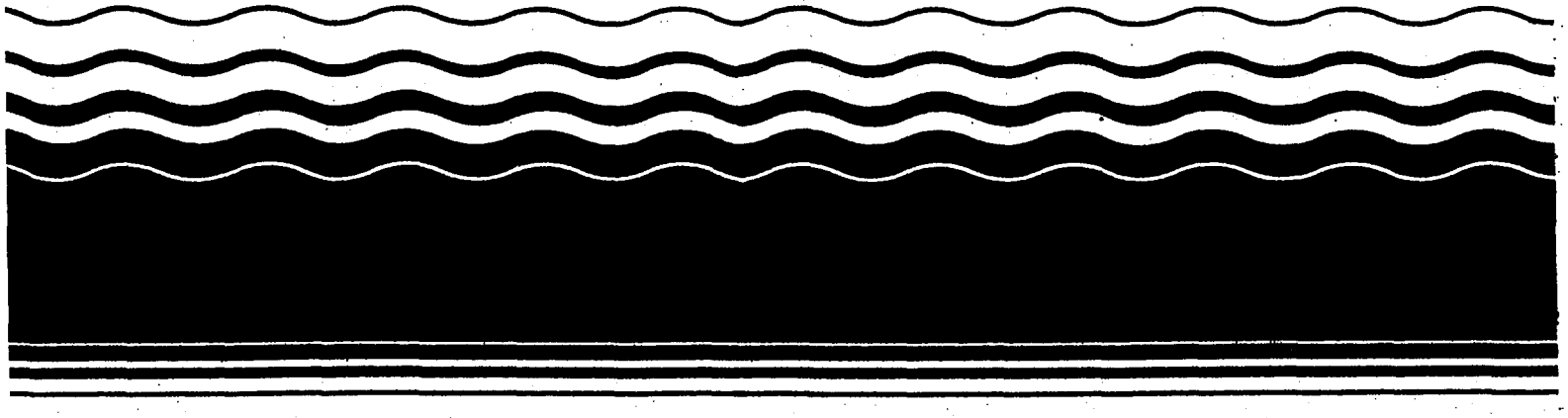
Office of Solid Waste
and Emergency
Response

EPA 540-R-92-026
November 1992

Superfund

EPA

Hazard Ranking System Guidance Manual



AGGREGATING SOURCES

Source aggregation refers to documenting two or more areas that could be considered individual sources as one discrete source when evaluating one or more pathways. ***Highlight 4-6*** provides criteria necessary to consider before aggregating sources. Sources may be aggregated in one pathway and treated separately in another pathway, based on the criteria listed in ***Highlight 4-6***. In general, it is advantageous to aggregate sources where possible because this should limit the number of separate sources evaluated without generally changing the overall site score.

The criteria in ***Highlight 4-6*** are appropriate for use when the sources under consideration are spatially separated from each other. When two sources overlap, consider site-specific information about the nature of the disposal operation, the hazardous substances found in the overlapping sources, and the containment characteristics of the sources in determining what sources should be aggregated. ***Highlights 4-7*** and ***4-8*** illustrate when to consider potential sources that apparently overlap as one source or two sources.

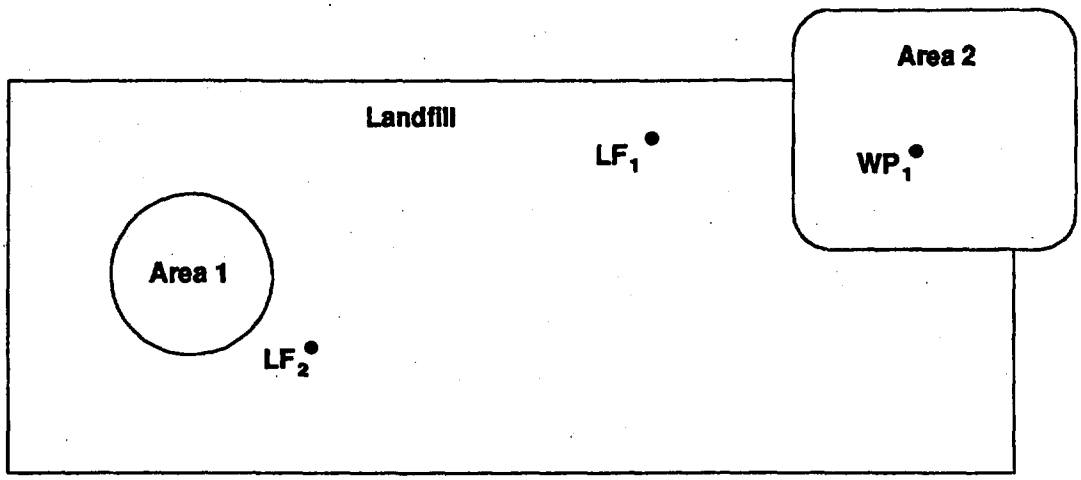
HIGHLIGHT 4-6
CHECKLIST FOR SOURCE AGGREGATION

Questions on this checklist should be used to determine whether to aggregate two or more sources for each pathway being evaluated.

(1)	Can the sources be classified as the same source type for the pathway? (e.g., drums, landfills, piles)	Yes	No
(2)	Do the sources affect similar target populations for the pathway? (i.e., target populations significantly overlap)	Yes	No
(3)	Do the sources have similar containment for the pathway? (e.g., liner, run-on and runoff controls, cover)	Yes	No
(4)	Do the sources contain substances with similar waste characteristic factor values available to the pathway? (e.g., toxicity, persistence, mobility)	Yes	No
(5)	Are the sources in the same watershed and floodplain? (surface water only)	Yes	No
(6)	Are the sources overlying the same aquifer system(s)? (ground water only)	Yes	No

If the answer to each of these questions is "Yes" then the sources should be aggregated and treated as one source for the pathway. If the answer is "No" to one or more of these questions, then the sources should be treated separately for the pathway.

HIGHLIGHT 4-7
WHEN TO AGGREGATE OVERLAPPING SOURCES



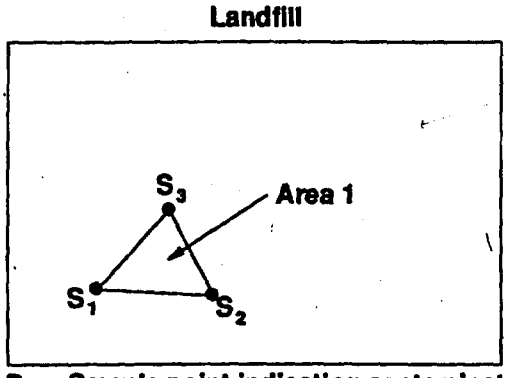
LF_x = Sampling point in landfill
WP_x = Sampling point in waste pile

- In assessing overlapping sources, consider site-specific disposal operations, hazardous substances found in the overlapping sources, and containment characteristics of the sources.
- In this example, two hazardous wastestreams (Areas 1 and 2) overlap within a closed landfill. Drums containing hazardous substances had been deposited in part of the landfill (Area 1) and tailings had been piled on top of the landfill (Area 2) after it closed.
- Sampling data show the following constituents exceed background:

  WP_1 = Arsenic, lead
  LF_1 = Arsenic, cadmium, mercury
  LF_2 = Arsenic, mercury, toluene

  Additionally, manifests indicate that drums containing benzene had been deposited in Area 1.
- The buried drums are a wastestream deposited in the landfill. These drums should not be considered a separate source.
- Consider Area 2 a separate source because the waste pile was deposited after the landfill was closed, and because the containment factors would score significantly different in selected pathways (e.g., air).

HIGHLIGHT 4-8
WHEN TO AGGREGATE CONTAMINATED SOIL WITH OTHER SOURCES



S_x = Sample point indicating contaminated surficial soils

Figure 1

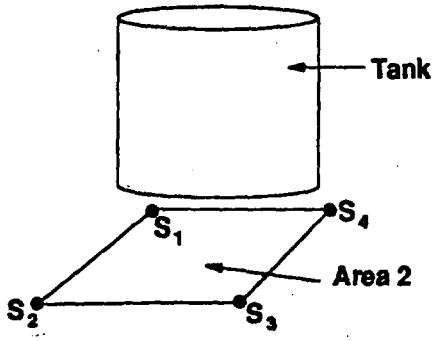


Figure 2

S_x = Sampling point indicating contaminated surficial soils

- In Figure 1, contaminated soil (Area 1) is covering a landfill. Determine if this is one source or two sources.
- If the hazardous substances found in surficial soil samples are also found in deeper samples in the landfill, the source is simply a landfill.
- If the hazardous substances found in surficial soil are not found in deeper samples, then consider this two sources -- contaminated soil and a landfill.
- In Figure 2, a leaking tank overlies an area of observed contamination (Area 2). Two sources would be present -- the tank and contaminated soil.

TIPS AND REMINDERS

- Score all sources that may significantly affect site score. In particular, consider possible changes to waste quantity, contaminant characteristics, or targets if the source is evaluated.

- Consider aggregating sources if they are the same source type and have similar characteristics (e.g., containment, proximity of units, target location, and hazardous substances associated with the units). Source aggregation for multiple-source units can change from pathway to pathway.

- For ground water, air, and soil exposure pathways, two strategies may be used to evaluate the applicable TDL and targets for multiple sources:

  — Targets can be the sum of the targets that fall into the distance categories around each individual source. This method is most appropriate when evaluating multiple sources that are large or far apart (i.e., distance categories drawn around each source do not overlap extensively).

  — Targets can be determined based on a single source that gives the highest targets factor category value. This method is appropriate for sites where considering multiple sources will not significantly affect the score.

- In the ground water migration pathway, it may be more efficient to measure the distance from each target well (if there are few) to the nearest source (if there are multiple sources) than to draw distance categories.

- For sources that are in the same watershed but have multiple PPEs to a watershed, the TDL should generally include the distance from the most upstream PPE to 15 miles from the most downstream PPE.

- For sources that have PPEs to different surface water bodies in the same watershed, determine the TDL from each PPE. The TDL for the watershed includes all in-water segments from these PPEs to the point where the water bodies merge plus the longest downstream distance as determined from each PPE.

- If sources are in different watersheds, score each watershed separately, and use the highest scoring watershed to score the pathway.

EPA United States Environmental Protection Agency

Waste Programs

PRG Tables: Na-Pu

PRG Home | **What's New** | **FAQ** | **Other Links**
R9 PRG Tables: A-Bu | Ca-De | Di-Fe | Fl-Mo | Na-Pu | Py-Zi
Soil Calculations: A-Bu | Ca-De | Di-Fe | Fl-Mo | Na-Pu | Py-Zi
Air-Water Calculations: A-Bu | Ca-De | Di-Fe | Fl-Mo | Na-Pu | Py-Zi
Toxicity Values: A-Bu | Ca-De | Di-Fe | Fl-Mo | Na-Pu | Py-Zi
Phys-Chem Data: A-Di | Ep-Tr

	CONTAMINANT	PRELIMINARY REMEDIATION GOALS (PRGs)								SOIL SCREENING LEVELS	
										Migration to Ground Water	
CAS No.		Residential Soil (mg/kg)		Industrial Soil (mg/kg)		Ambient Air (ug/m^3)		Tap Water (ug/l)		DAF 20 (mg/kg)	DAF 1 (mg/kg)
300-76-5	Naled	1.2E+02	nc	1.8E+03	nc	7.3E+00	nc	7.3E+01	nc		
15299-99-7	Napropamide	6.1E+03	nc	8.8E+04	nc	3.7E+02	nc	3.6E+03	nc		
7440-02-0	Nickel (soluble salts)	1.6E+03	nc	4.1E+04	nc			7.3E+02	nc	1.3E+02	7.0E+00
	"CAL-Modified PRG" (PEA, 1994)	1.5E+02									
	Nickel refinery dust					8.0E-03	ca				
12035-72-2	Nickel subsulfide			1.1E+04	ca	4.0E-03	ca				
1929-82-4	Nitrapyrin	9.2E+01	nc	1.3E+03	nc	5.5E+00	nc	5.5E+01	nc		
14797-55-8	Nitrate							1.0E+04	nc		
10102-43-9	Nitric Oxide	7.8E+03	nc	1.0E+05	max			3.6E+03	nc		
14797-65-0	Nitrite							1.0E+03	nc		
88-74-4	2-Nitroaniline	3.5E+00	nc	5.0E+01	nc	2.1E-01	nc	2.1E+00	nc		
98-95-3	Nitrobenzene	2.0E+01	nc	1.1E+02	nc	2.1E+00	nc	3.4E+00	nc	1.0E-01	7.0E-03
67-20-9	Nitrofurantoin	4.3E+03	nc	6.2E+04	nc	2.6E+02	nc	2.6E+03	nc		
59-87-0	Nitrofurazone	3.2E-01	ca	1.6E+00	ca	7.2E-04	ca	4.5E-02	ca		
55-63-0	Nitroglycerin	3.5E+01	ca	1.8E+02	ca	4.8E-01	ca	4.8E+00	ca		
556-88-7	Nitroguanidine	6.1E+03	nc	8.8E+04	nc	3.7E+02	nc	3.6E+03	nc		
100-02-7	4-Nitrophenol	4.9E+02	nc	7.0E+03	nc	2.9E+01	nc	2.9E+02	nc		

79-46-9	2-Nitropropane					7.2E-04	ca	1.2E-03	ca		
924-16-3	N-Nitrosodi-n-butylamine	2.4E-02	ca	6.1E-02	ca	1.2E-03	ca	2.0E-03	ca		
1116-54-7	N-Nitrosodiethanolamine	1.7E-01	ca	8.8E-01	ca	2.4E-03	ca	2.4E-02	ca		
55-18-5	N-Nitrosodiethylamine	3.2E-03	ca	1.6E-02	ca	4.5E-05	ca	4.5E-04	ca		
62-75-9	N-Nitrosodimethylamine	9.5E-03	ca	4.8E-02	ca	1.4E-04	ca	1.3E-03	ca		
86-30-6	N-Nitrosodiphenylamine	9.9E+01	ca	5.0E+02	ca	1.4E+00	ca	1.4E+01	ca	1.0E+00	6.0E-02
621-64-7	N-Nitroso di-n-propylamine	6.9E-02	ca	3.5E-01	ca	9.6E-04	ca	9.6E-03	ca	5.0E-05	2.0E-06
10595-95-6	N-Nitroso-N-methylethylamine	2.2E-02	ca	1.1E-01	ca	3.1E-04	ca	3.1E-03	ca		
930-55-2	N-Nitrosopyrrolidine	2.3E-01	ca	1.2E+00	ca	3.1E-03	ca	3.2E-02	ca		
99-08-1	m-Nitrotoluene	3.7E+02	nc	1.0E+03	sat	3.7E+01	nc	6.1E+01	nc		
88-72-2	o-Nitrotoluene	3.7E+02	nc	1.0E+03	sat	3.7E+01	nc	6.1E+01	nc		
99-99-0	p-Nitrotoluene	3.7E+02	nc	1.0E+03	sat	3.7E+01	nc	6.1E+01	nc		
27314-13-2	Norflurazon	2.4E+03	nc	3.5E+04	nc	1.5E+02	nc	1.5E+03	nc		
85509-19-9	NuStar	4.3E+01	nc	6.2E+02	nc	2.6E+00	nc	2.6E+01	nc		
32536-52-0	Octabromodiphenyl ether	1.8E+02	nc	2.6E+03	nc	1.1E+01	nc	1.1E+02	nc		
152-16-9	Octamethylpyrophosphoramide	1.2E+02	nc	1.8E+03	nc	7.3E+00	nc	7.3E+01	nc		
19044-88-3	Oryzalin	3.1E+03	nc	4.4E+04	nc	1.8E+02	nc	1.8E+03	nc		
19666-30-9	Oxadiazon	3.1E+02	nc	4.4E+03	nc	1.8E+01	nc	1.8E+02	nc		
23135-22-0	Oxamyl	1.5E+03	nc	2.2E+04	nc	9.1E+01	nc	9.1E+02	nc		
42874-03-3	Oxyfluorfen	1.8E+02	nc	2.6E+03	nc	1.1E+01	nc	1.1E+02	nc		
76738-62-0	Paclobutrazol	7.9E+02	nc	1.1E+04	nc	4.7E+01	nc	4.7E+02	nc		
4685-14-7	Paraquat	2.7E+02	nc	4.0E+03	nc	1.6E+01	nc	1.6E+02	nc		
56-38-2	Parathion	3.7E+02	nc	5.3E+03	nc	2.2E+01	nc	2.2E+02	nc		
1114-71-2	Pebulate	3.1E+03	nc	4.4E+04	nc	1.8E+02	nc	1.8E+03	nc		
40487-42-1	Pendimethalin	2.4E+03	nc	3.5E+04	nc	1.5E+02	nc	1.5E+03	nc		
87-84-3	Pentabromo-6-chloro cyclohexane	2.1E+01	ca	1.1E+02	ca	2.9E-01	ca	2.9E+00	ca		
32534-81-9	Pentabromodiphenyl ether	1.2E+02	nc	1.8E+03	nc	7.3E+00	nc	7.3E+01	nc		
608-93-5	Pentachlorobenzene	4.9E+01	nc	7.0E+02	nc	2.9E+00	nc	2.9E+01	nc		
82-68-8	Pentachloronitrobenzene	1.9E+00	ca*	9.5E+00	ca	2.6E-02	ca	2.6E-01	ca		
87-86-5	Pentachlorophenol	3.0E+00	ca	1.1E+01	ca	5.6E-02	ca	5.6E-01	ca	3.0E-02	1.0E-03

7601-90-3	Perchlorate	3.9E+01	nc	1.0E+03	nc			1.8E+01	nc		
52645-53-1	Permethrin	3.1E+03	nc	4.4E+04	nc	1.8E+02	nc	1.8E+03	nc		
13684-63-4	Phenmedipham	1.5E+04	nc	1.0E+05	max	9.1E+02	nc	9.1E+03	nc		
108-95-2	Phenol	3.7E+04	nc	1.0E+05	max	2.2E+03	nc	2.2E+04	nc	1.0E+02	5.0E+00
92-84-2	Phenothiazine	1.2E+02	nc	1.8E+03	nc	7.3E+00	nc	7.3E+01	nc		
108-45-2	m-Phenylenediamine	3.7E+02	nc	5.3E+03	nc	2.2E+01	nc	2.2E+02	nc		
106-50-3	p-Phenylenediamine	1.2E+04	nc	1.0E+05	max	6.9E+02	nc	6.9E+03	nc		
62-38-4	Phenylmercuric acetate	4.9E+00	nc	7.0E+01	nc	2.9E-01	nc	2.9E+00	nc		
90-43-7	2-Phenylphenol	2.5E+02	ca	1.3E+03	ca	3.5E+00	ca	3.5E+01	ca		
298-02-2	Phorate	1.2E+01	nc	1.8E+02	nc	7.3E-01	nc	7.3E+00	nc		
732-11-6	Phosmet	1.2E+03	nc	1.8E+04	nc	7.3E+01	nc	7.3E+02	nc		
7803-51-2	Phosphine	1.8E+01	nc	2.6E+02	nc	3.1E-01	nc	1.1E+01	nc		
7664-38-2	Phosphoric acid					1.0E+01	nc				
7723-14-0	Phosphorus (white)	1.6E+00	nc	4.1E+01	nc			7.3E-01	nc		
100-21-0	p-Phthalic acid	6.1E+04	nc	1.0E+05	max	3.7E+03	nc	3.6E+04	nc		
85-44-9	Phthalic anhydride	1.0E+05	max	1.0E+05	max	1.2E+02	nc	7.3E+04	nc		
1918-02-1	Picloram	4.3E+03	nc	6.2E+04	nc	2.6E+02	nc	2.6E+03	nc		
23505-41-1	Pirimiphos-methyl	6.1E+02	nc	8.8E+03	nc	3.7E+01	nc	3.6E+02	nc		
	Polybrominated biphenyls	5.5E-02	ca**	2.8E-01	ca*	7.6E-04	ca*	7.6E-03	ca*		
1336-36-3	Polychlorinated biphenyls (PCBs)	2.2E-01	ca	1.0E+00	ca	3.4E-03	ca	3.4E-02	ca		
12674-11-2	Aroclor 1016	3.9E+00	nc	2.9E+01	ca**	9.6E-02	ca**	9.6E-01	ca**		
11104-28-2	Aroclor 1221	2.2E-01	ca	1.0E+00	ca	3.4E-03	ca	3.4E-02	ca		
11141-16-5	Aroclor 1232	2.2E-01	ca	1.0E+00	ca	3.4E-03	ca	3.4E-02	ca		
53469-21-9	Aroclor 1242	2.2E-01	ca	1.0E+00	ca	3.4E-03	ca	3.4E-02	ca		
12672-29-6	Aroclor 1248	2.2E-01	ca	1.0E+00	ca	3.4E-03	ca	3.4E-02	ca		
11097-69-1	Aroclor 1254	2.2E-01	ca**	1.0E+00	ca*	3.4E-03	ca*	3.4E-02	ca*		
11096-82-5	Aroclor 1260	2.2E-01	ca	1.0E+00	ca	3.4E-03	ca	3.4E-02	ca		
	Polynuclear aromatic hydrocarbons (PAHs)										
83-32-9	Acenaphthene	3.7E+03	nc	3.8E+04	nc	2.2E+02	nc	3.7E+02	nc	5.7E+02	2.9E+01
120-12-7	Anthracene	2.2E+04	nc	1.0E+05	max	1.1E+03	nc	1.8E+03	nc	1.2E+04	5.9E+02

56-55-3	Benz[a]anthracene	6.2E-01	ca	2.9E+00	ca	2.2E-02	ca	9.2E-02	ca	2.0E+00	8.0E-02
205-99-2	Benzo[b]fluoranthene	6.2E-01	ca	2.9E+00	ca	2.2E-02	ca	9.2E-02	ca	5.0E+00	2.0E-01
207-08-9	Benzo[k]fluoranthene	6.2E+00	ca	2.9E+01	ca	2.2E-01	ca	9.2E-01	ca	4.9E+01	2.0E+00
	"CAL-Modified PRG" (PEA, 1994)	6.1E-01									
50-32-8	Benzo[a]pyrene	6.2E-02	ca	2.9E-01	ca	2.2E-03	ca	9.2E-03	ca	8.0E+00	4.0E-01
	"CAL-Modified PRG" (PEA, 1994)							1.5E-03			
218-01-9	Chrysene	6.2E+01	ca	2.9E+02	ca	2.2E+00	ca	9.2E+00	ca	1.6E+02	8.0E+00
	"CAL-Modified PRG" (PEA, 1994)	6.1E+00									
53-70-3	Dibenz[ah]anthracene	6.2E-02	ca	2.9E-01	ca	2.2E-03	ca	9.2E-03	ca	2.0E+00	8.0E-02
206-44-0	Fluoranthene	2.3E+03	nc	3.0E+04	nc	1.5E+02	nc	1.5E+03	nc	4.3E+03	2.1E+02
86-73-7	Fluorene	2.6E+03	nc	3.3E+04	nc	1.5E+02	nc	2.4E+02	nc	5.6E+02	2.8E+01
193-39-5	Indeno[1,2,3-cd]pyrene	6.2E-01	ca	2.9E+00	ca	2.2E-02	ca	9.2E-02	ca	1.4E+01	7.0E-01
91-20-3	Naphthalene	5.6E+01	nc	1.9E+02	nc	3.1E+00	nc	6.2E+00	nc	8.4E+01	4.0E+00
129-00-0	Pyrene	2.3E+03	nc	5.4E+04	nc	1.1E+02	nc	1.8E+02	nc	4.2E+03	2.1E+02
67747-09-5	Prochloraz	3.2E+00	ca	1.6E+01	ca	4.5E-02	ca	4.5E-01	ca		
26399-36-0	Profluralin	3.7E+02	nc	5.3E+03	nc	2.2E+01	nc	2.2E+02	nc		
1610-18-0	Prometon	9.2E+02	nc	1.3E+04	nc	5.5E+01	nc	5.5E+02	nc		
7287-19-6	Prometryn	2.4E+02	nc	3.5E+03	nc	1.5E+01	nc	1.5E+02	nc		
23950-58-5	Pronamide	4.6E+03	nc	6.6E+04	nc	2.7E+02	nc	2.7E+03	nc		
1918-16-7	Propachlor	7.9E+02	nc	1.1E+04	nc	4.7E+01	nc	4.7E+02	nc		
709-98-8	Propanil	3.1E+02	nc	4.4E+03	nc	1.8E+01	nc	1.8E+02	nc		
2312-35-8	Propargite	1.2E+03	nc	1.8E+04	nc	7.3E+01	nc	7.3E+02	nc		
107-19-7	Propargyl alcohol	1.2E+02	nc	1.8E+03	nc	7.3E+00	nc	7.3E+01	nc		
139-40-2	Propazine	1.2E+03	nc	1.8E+04	nc	7.3E+01	nc	7.3E+02	nc		
122-42-9	Propham	1.2E+03	nc	1.8E+04	nc	7.3E+01	nc	7.3E+02	nc		
60207-90-1	Propiconazole	7.9E+02	nc	1.1E+04	nc	4.7E+01	nc	4.7E+02	nc		
98-82-8	Isopropylbenzene (Cumene)	1.6E+02	nc	5.2E+02	nc	4.0E+02	nc	6.6E+02	nc		
103-65-1	n-Propylbenzene	1.4E+02	nc	2.4E+02	sat	3.7E+01	nc	6.1E+01	nc		
57-55-6	Propylene glycol	1.0E+05	max	1.0E+05	max	7.3E+04	nc	7.3E+05	nc		
111-35-3	Propylene glycol, monoethyl ether	4.3E+04	nc	1.0E+05	max	2.6E+03	nc	2.6E+04	nc		
107-98-2	Propylene glycol, monomethyl ether	4.3E+04	nc	1.0E+05	max	2.1E+03	nc	2.6E+04	nc		
75-56-9	Propylene oxide	1.9E+00	ca*	9.1E+00	ca*	5.2E-01	ca*	2.2E-01	ca		
81335-77-5	Pursuit	1.5E+04	nc	1.0E+05	max	9.1E+02	nc	9.1E+03	nc		

Key:

i = IRIS
h = HEAST
n = NCEA
x = WITHDRAWN
o = OTHER EPA DOCUMENTS
r = ROUTE EXTRAPOLATION
ca = CANCER PRG
nc = NONCANCER PRG
sat = SOIL SATURATION
max = CEILING LIMIT
*indicates that the noncancer PRG < = 100X the cancer PRG
**indicates that the noncancer PRG < 10X the cancer PRG
BOLD=New or revised Toxicity values

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